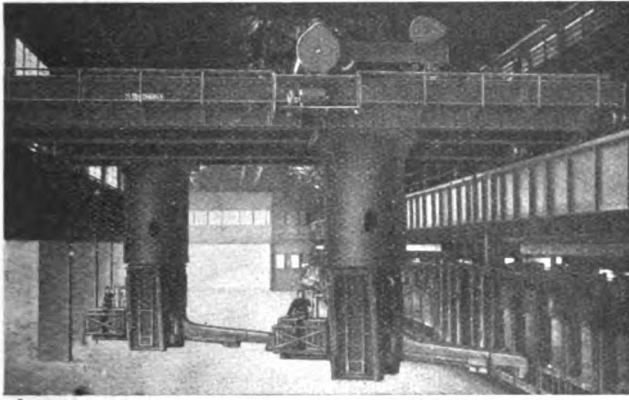




The Cranes For Service

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Write and tell us your problems.

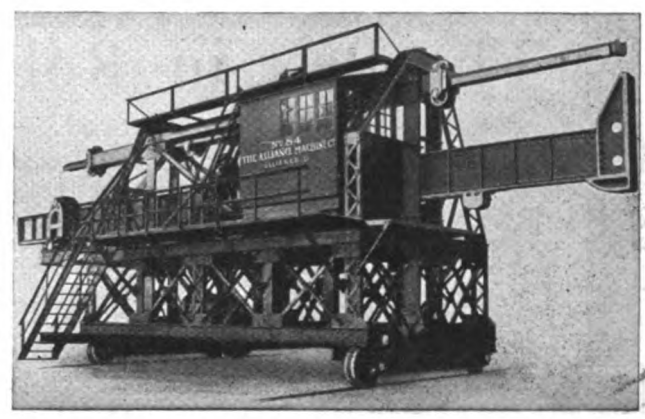
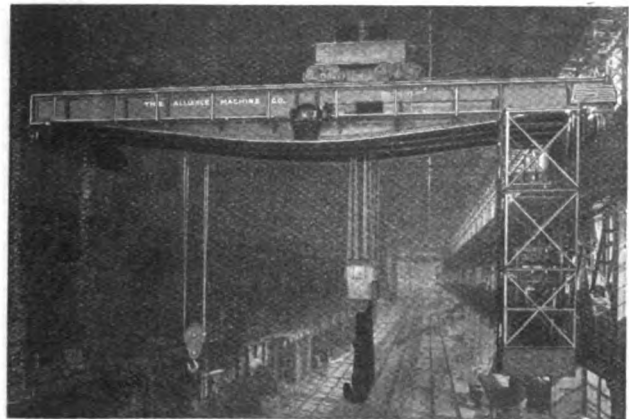
The Alliance Machine Co.

Pittsburgh

Alliance, Ohio.

Birmingham

The World's Largest Builders of the World's Largest Cranes.



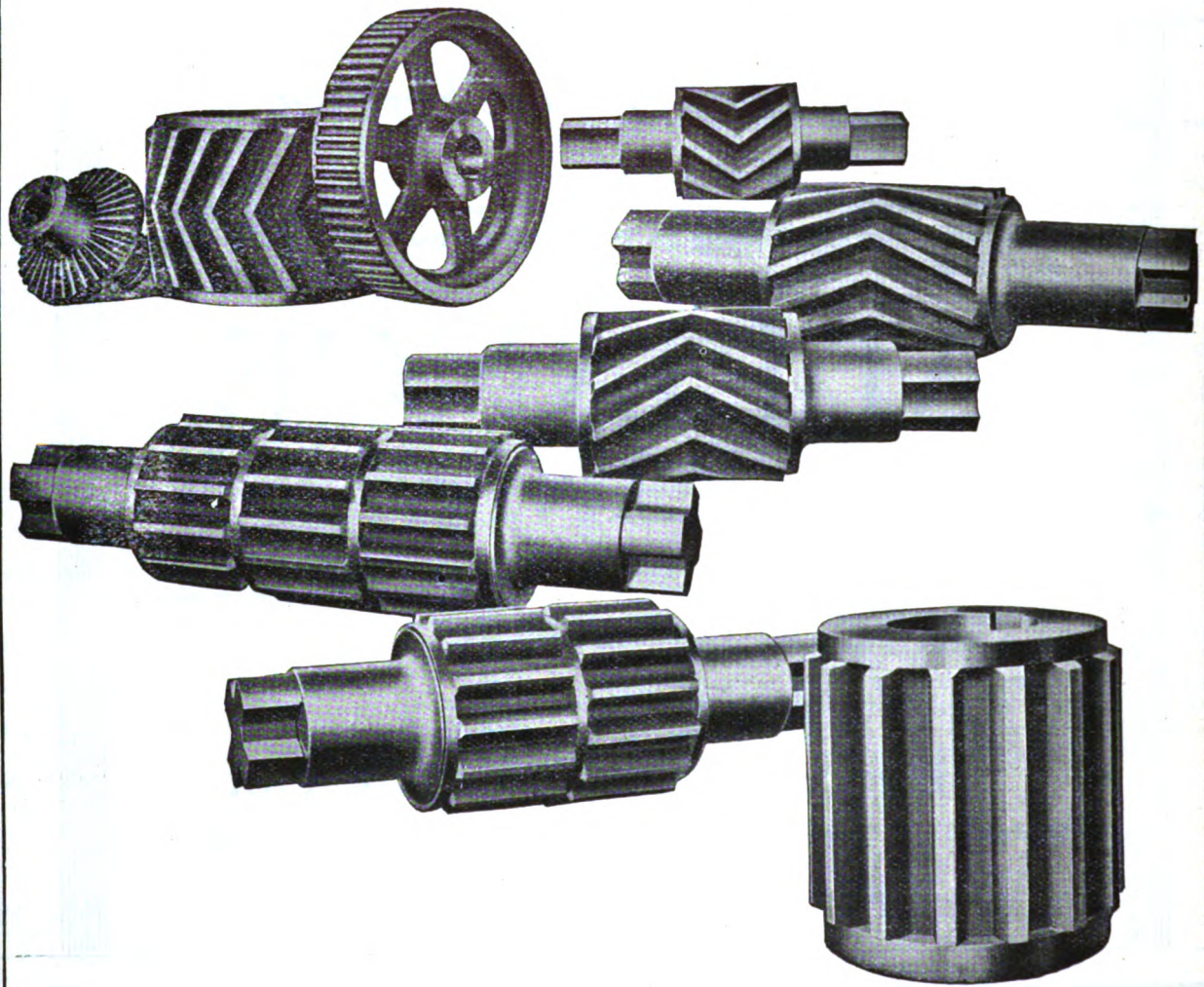
Co-operate:—Refer to The Blast Furnace and Steel Plant

Our Gears and Pinions

Machine Cut or Cast Teeth

Stand First for Accuracy

Strength and Wearing Qualities



The Best in Rolling Mill Machinery

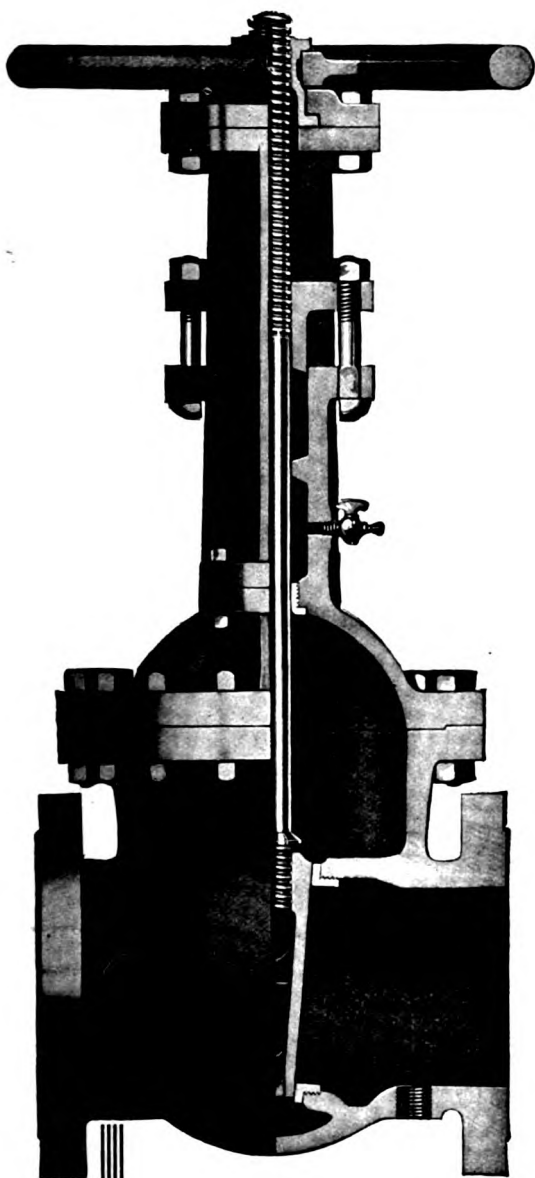
MACKINTOSH-HEMPHILL & CO.

Fort Pitt Foundry

Pittsburgh, Penna., U. S. A.



Co-operate:—Refer to The Blast Furnace and Steel Plant



A Few Blast Furnace Plants Where CHAPMAN VALVES Have Been Installed:—

Alan Wood Iron & Steel Co.
American Iron & Steel Co.
Bethlehem Steel Company.
Carpenter Steel Company.
Dominion Iron & Steel Co.
Ford Motor Company.
Lukens Iron & Steel Co.
Midvale Steel Company.
Minneapolis Steel Company.
Republic Iron & Steel Company.
Steel & Tube Co. of America.
United Alloy Steel Corporation.
Youngstown Sheet & Tube Co.

CHAPMAN VALVES

The above illustration shows a section of List 63½ Wedge type steel gate valve for super-heated steam showing internal working parts. 350 pounds working pressure. 800 degrees total temperature.

Body and cap of cast steel, spindle of Rolled Monel, Spindle seats and seat rings of cast Monel. Valves up to 4½" size inclusive have solid Monel plugs—5" and above, cast steel plugs with Monel faces, rolled in by special process and guaranteed not to work loose. Six bosses are cast on each valve body so that tapping can be made in any desired position. Caps are made of the long neck type allowing for radiation so that the intense heat does not reach the packing, thus lengthening its life.

Lower illustration shows Iron Body Gate Valve for Water, Steam, Air or Gas, furnished with Bronze or Iron Mountings, Single or Double Discs, Inside or Outside Screw. Designed for minimum space. An excellent valve on pump suction lines, exhaust and condenser piping in steam power plants and by-product coke plants.

Send for a copy of Catalog No. 38. Contains 338 pages of valuable data on valves. Your copy on request.



The Chapman Valve Mfg. Co.

Indian Orchard, Mass.

Branches and Agents with stock:
Boston Chicago New York Pittsburgh Philadelphia San Francisco

Co-operate:—Refer to The Blast Furnace and Steel Plant

Retain the Heat—Increase the Capacity

HOT blast stoves can be insulated so that heat losses will be reduced to a minimum and the same equipment, the same amount of fuel, labor, etc., made to produce more tons of pig iron than before.

This increased effectiveness is made possible by insulating your stoves and other blast furnace equipment with SIL-O-CEL, a material having a very low heat conductivity factor.

SIL-O-CEL prevents heat losses, and protects the shell against strain, rupture and overheating.



SIL-O-CEL
PREVENTS HEAT PENETRATION
TRADE MARK
MADE FROM CELITE

Insulation stops heat losses by preventing heat penetration. Send for Blast Furnace literature.

Tell us what part of your equipment is wasting heat and our engineers will tell you how to prevent it.

SIL-O-CEL has been applied to hot blast stoves, sides and crowns; hot blast mains, hot blast valves, bustle pipes, hot metal cars, transfer ladles, metal mixers; boiler settings, walls, tops, bases, doors, flues and breechings; also pipe covering.

Its increased use in large plants where efficiency is the keynote is an indication of its success.

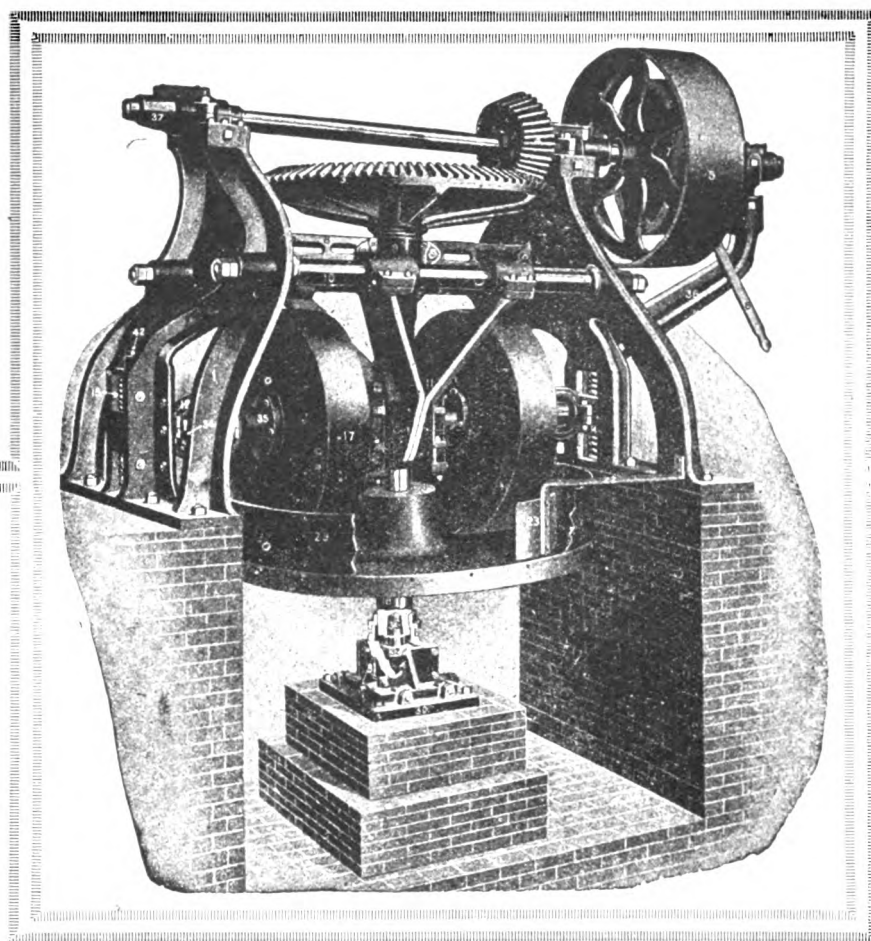
SIL-O-CEL
increases
production

CELITE PRODUCTS COMPANY

NEW YORK 11 Broadway
LOS ANGELES Van Nuys Building
PITTSBURGH Oliver Building
SAN FRANCISCO Monednock Building
CHICAGO Monednock Building

SIL-O-CEL
saves fuel

Co-operate:—Refer to The Blast Furnace and Steel Plant



STEVENSON'S GRINDING AND MIXING PANS

are saving time, labor and money in some of the most efficient plants in the steel industry. Stevenson Pans are paying for themselves out of materials saved in the preparation, mixing or reclaiming materials such as fire clays, sands, dust metal, inside cores, sea coal, facing materials, brick slate, cement, dolomite, pyrite, iron ore, magnetite, etc.

Their rugged construction, adaptability, accessibility of all parts and economy of operation have met the demand for an "all around" satisfactory grinder. There's a type of Stevenson Pan built for every specific duty.

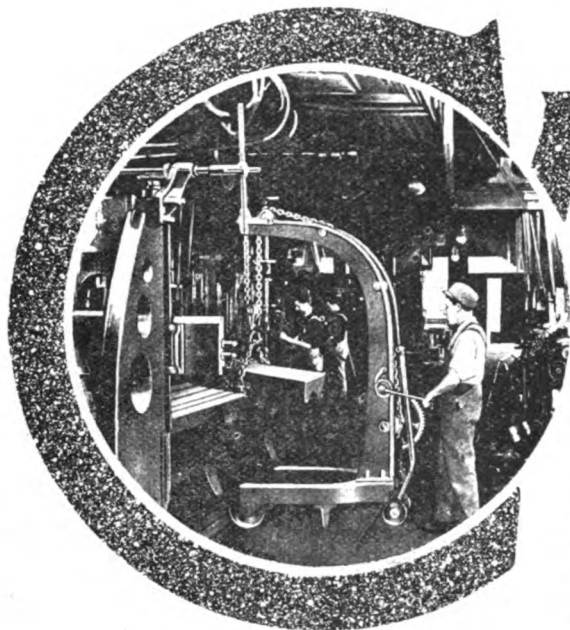
Stevensons are saving money in other plants, why not yours? Write today.

THE STEVENSON COMPANY

WELLSVILLE, OHIO

Engineering and Western Sales Offices Monadnock Bldg., Chicago.

Co-operate:—Refer to The Blast Furnace and Steel Plant



CANTON

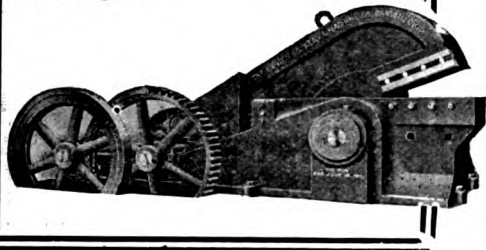
Are your lifting costs running high? Why not reduce them by installing the handy, quick and efficient Canton Portable Floor Crane and Hoist. The Crane will lift your work and carry it to all parts of your shop and can reach many parts which an overhead crane cannot possibly reach.

THE CANTON PORTABLE FLOOR CRANE AND HOIST

is of unusually rugged construction and design. One man with a "Canton" Crane can do far more work than six men and in less time. "Canton" Cranes are cutting lifting costs in some of the largest plants in the country. Why not yours? "Write today for catalog E-1."

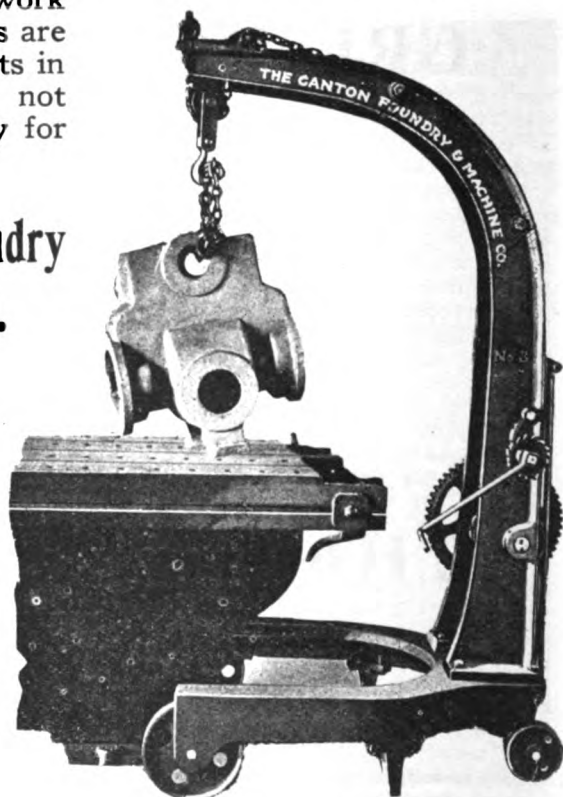
CANTON ALLIGATOR SHEARS

are of extremely high quality. Best materials obtainable are used in their construction. Large well proportioned castings insure long life and efficient service. Canton Shears may be had in many styles and sizes. There's a Canton Shear that will meet your needs exactly. Send for catalog "D-1."



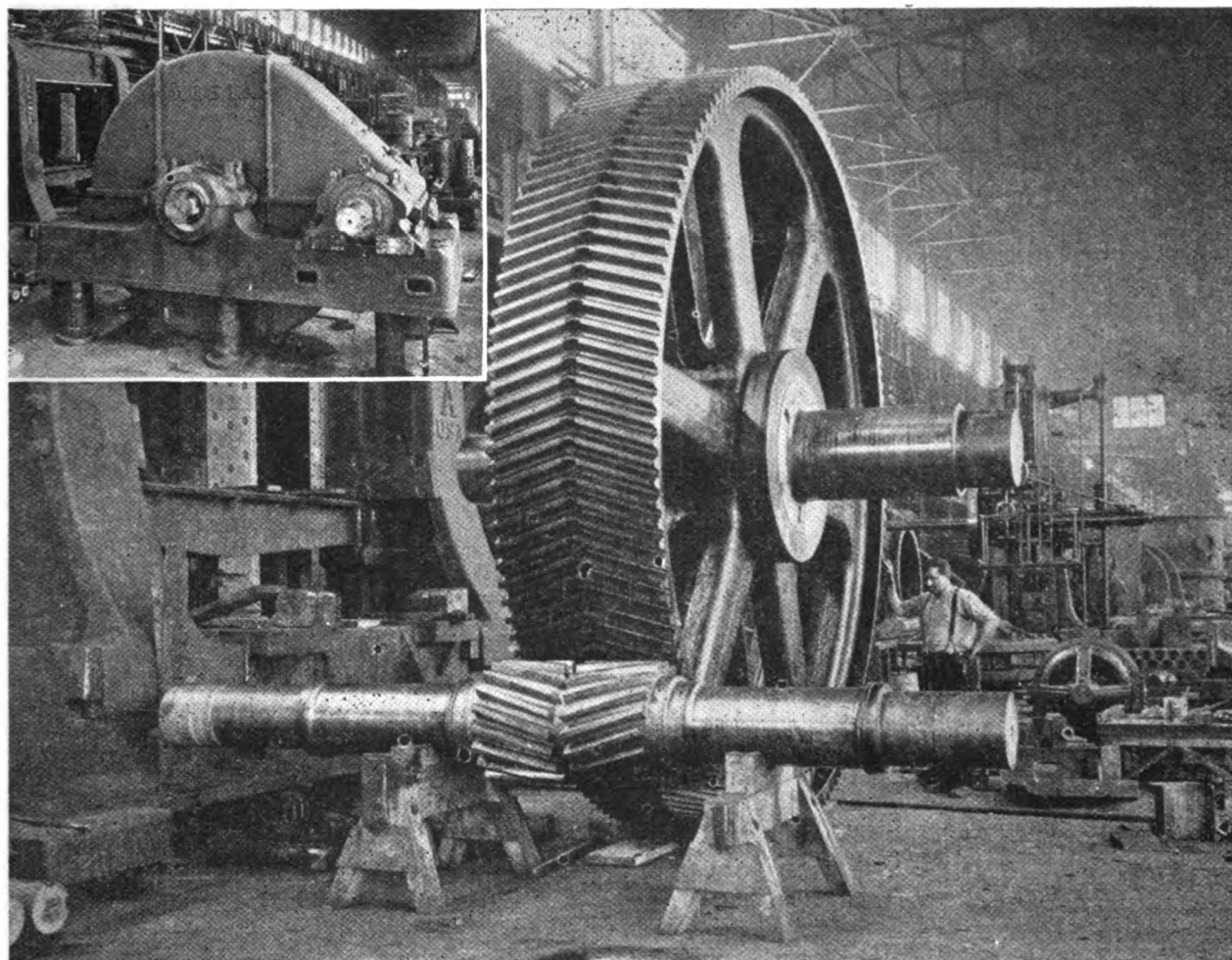
The Canton Foundry & Machine Co.

Canton, Ohio.



Co-operate:—Refer to The Blast Furnace and Steel Plant

MESTA ROLLING MILL DRIVES



DOUBLE HELICAL CUT TOOTH GEARS for 1800 H. P. ROLLING MILL DRIVE
Motor Speed 240 R. P. M. Mill Speed 30 R. P. M.

Mesta Rolling Mill Drives like Mesta Rolling Mill Engines are designed and built to fully meet the demands of Rolling Mill service.

Built in any size from 500 H. P. up.

Write for Bulletin "K" and "KA"

MESTA MACHINE COMPANY
PITTSBURGH PENNSYLVANIA

Manufacturers of

Gas and Steam Engines, Blowing Engines, Reversing Engines, Rolling Mill Machinery, Forging Presses, Gear Drives, Air Compressors, Condensers, Rolls, Pinions, Cut and Machine Molded Gears, Iron and Steel Castings, Forgings, Forging Ingots, etc.

Co-operate:—Refer to The Blast Furnace and Steel Plant



FOR outdoor operation the smooth un-failing operation of the CHAMPION CRANE is pleasing.

All electrical equipment and all running gear are so carefully protected that bad weather has no effect upon it.

Our Engineering Staff is maintained to give you facts and figures on Crane economies. You are invited to avail yourself of their services.

THE CHAMPION ENGINEERING CO.

ENGINEERS — MANUFACTURERS — KENTON — OHIO

R. W. Valls, Vice President and Chief Engineer.

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J. W. Spensley, Sales Engr.
149 Broadway.

Portland, Ore.

Portland Machinery Co.
62 First St.

Philadelphia

Williams & Thomas Mach. Co.
829 Commercial Trust Bldg.

Pittsburgh

Laughlin-Barney Mach. Co.
Union Arcade

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L. C. Smith Bldg.

Paris, France

L. & E. Frenkel, Inc.
20 Rue des Capucines

Toledo

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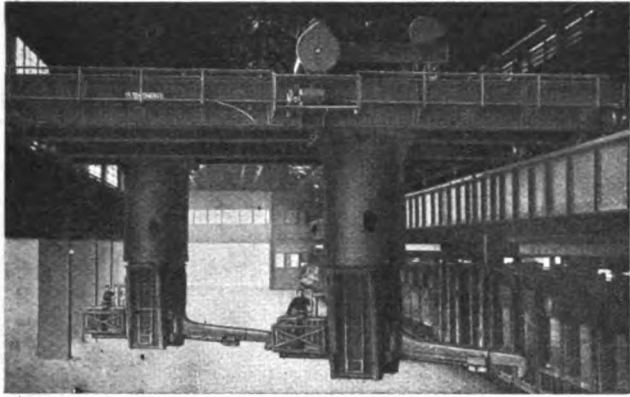
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Louis G. Henes
76 Fremont St.

Los Angeles

Louis G. Henes
Title Insurance Bldg.

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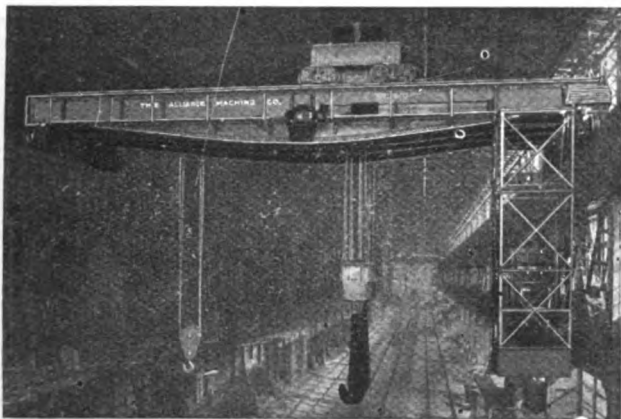
The Alliance Machine Co.

Pittsburgh

Alliance, Ohio.

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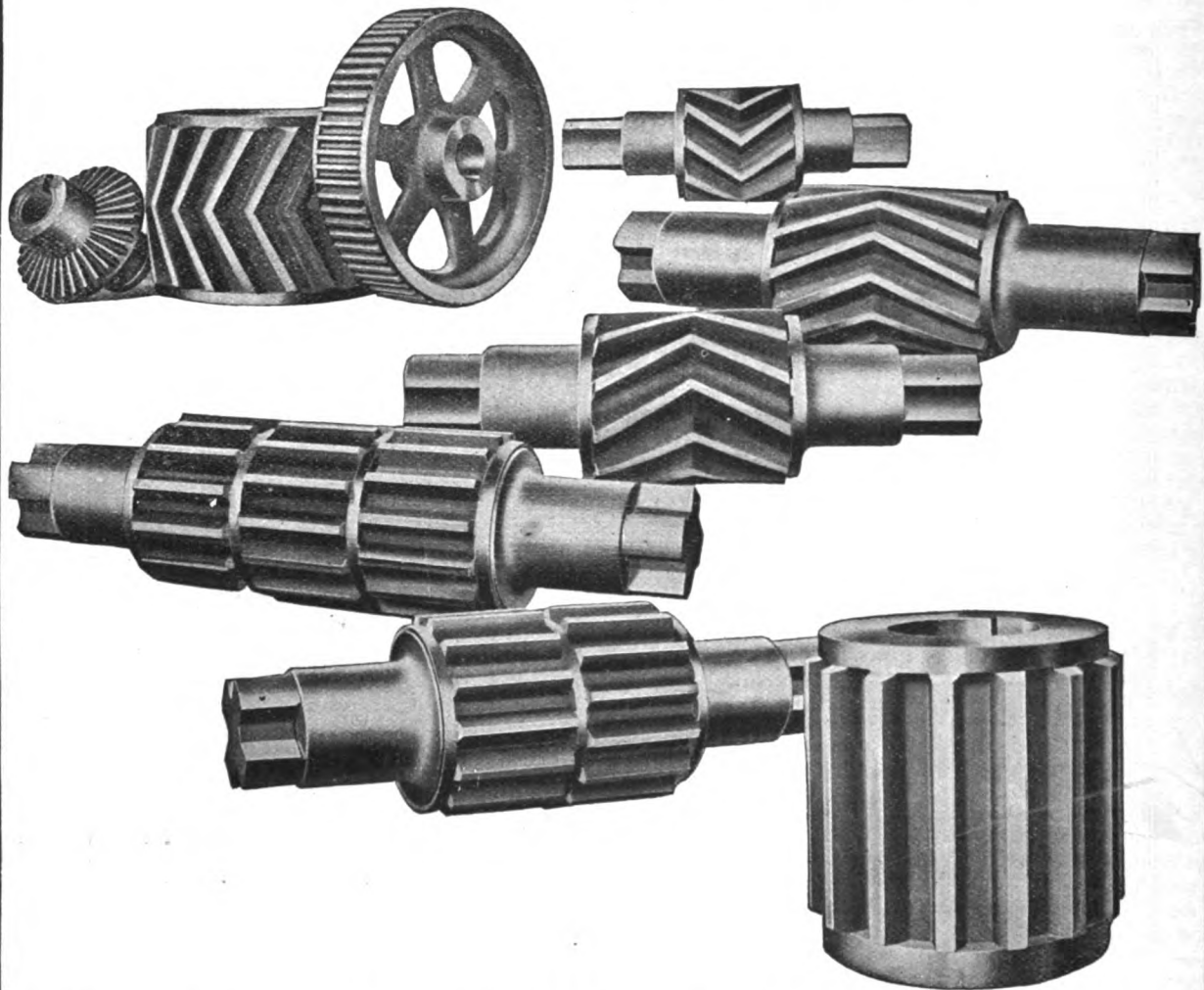
Co-operate:—Refer to The Blast Furnace and Steel Plant

Our Gears and Pinions

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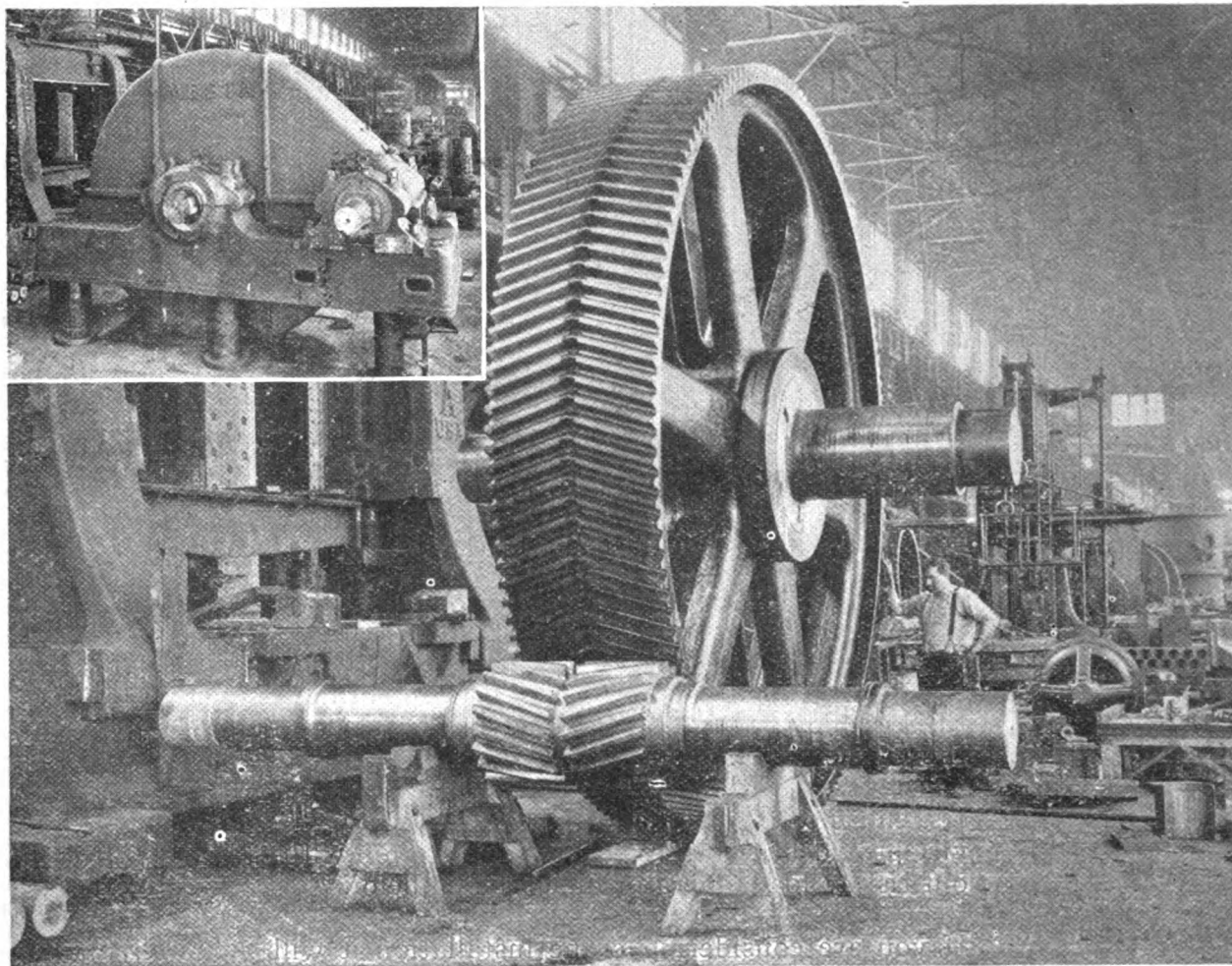
The Best in Rolling Mill Machinery

MACKINTOSH-HEMPHILL & CO.
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Co-operate:—Refer to The Blast Furnace and Steel Plant



At the plant of the Skandia Pacific Oil Engine Co., Oakland, Cal.

20 Tons! Up, up it goes,
swiftly, gently with
the firm smoothness
that demonstrates the tremendous strength of
the Crane.

Its enormous power and automatic safety device provides for fast, continuous operation without risk to load, operator or workmen below.

If you are considering crane installation it will pay you well to investigate the Champion. Ask our Engineering Department for facts and figures.

THE CHAMPION ENGINEERING CO. ENGINEERS — MANUFACTURERS — KENTON — OHIO

R. W. Vahl Vice President and Chief Engineer.

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For the mixer too, with its constant charge of molten metal and intermittent pouring there is a fire brick among

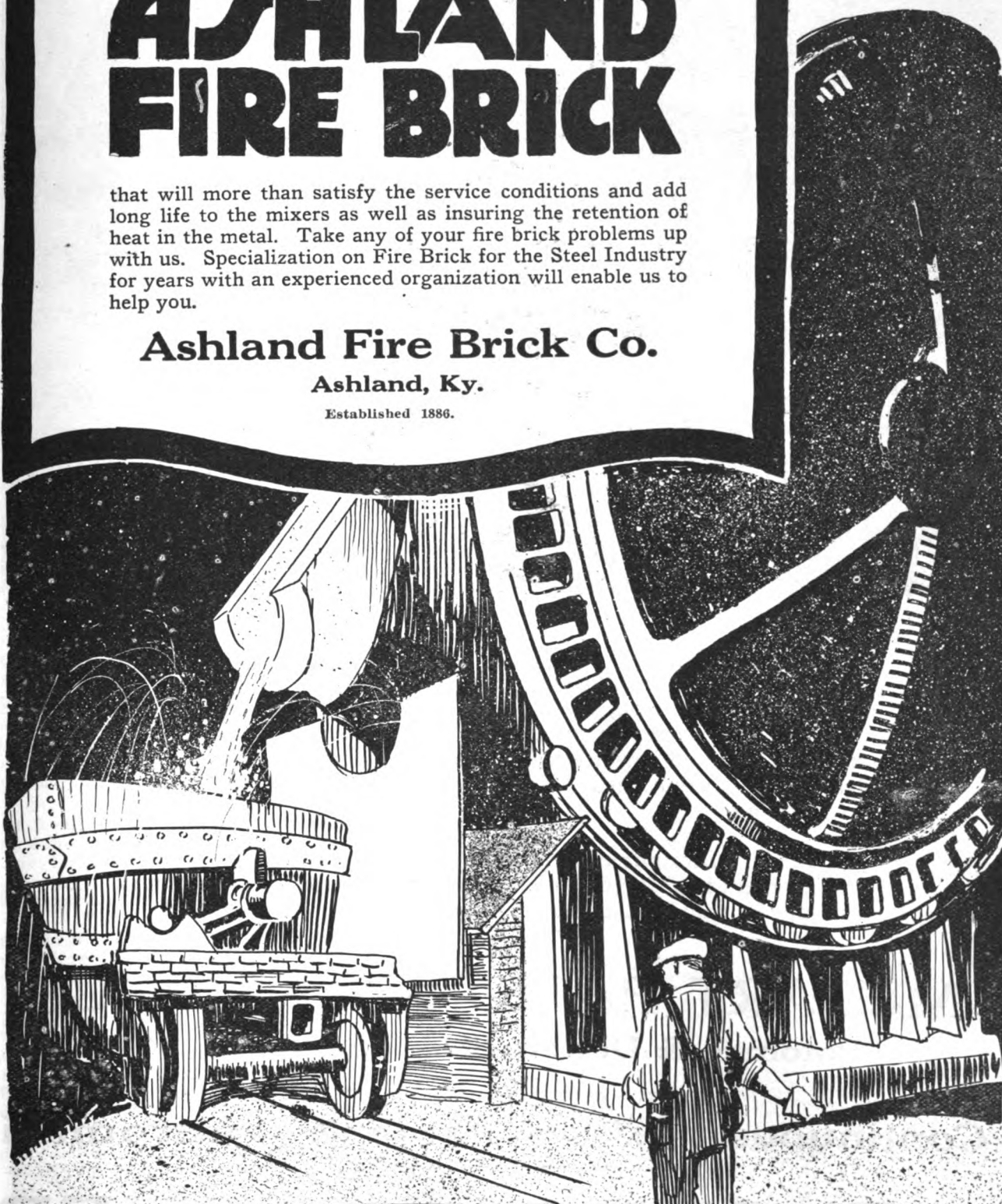
ASHLAND FIRE BRICK

that will more than satisfy the service conditions and add long life to the mixers as well as insuring the retention of heat in the metal. Take any of your fire brick problems up with us. Specialization on Fire Brick for the Steel Industry for years with an experienced organization will enable us to help you.

Ashland Fire Brick Co.

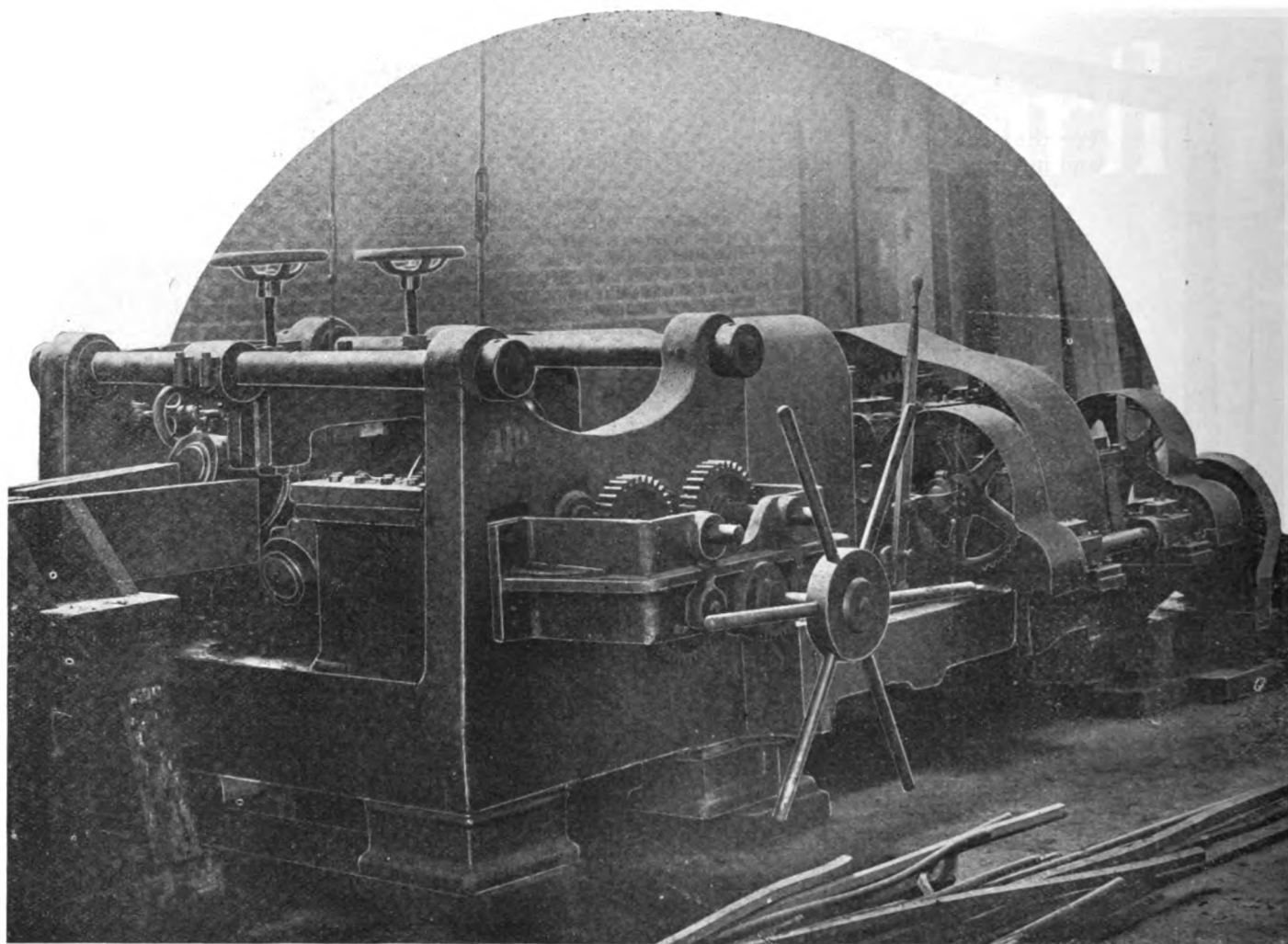
Ashland, Ky.

Established 1886.



"Line with the Ashland Line"

Co-operate:—Refer to The Blast Furnace and Steel Plant



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On Medart Straighteners any length bars can be straightened in diameters from $\frac{1}{16}$ " to 6". For efficient operation there's no machine its equal. Let us send you our catalog.

MEDART PATENT PULLEY CO.

Potomac & DeKalb Sts., St. Louis, Mo.

Continuous **MEDART** Automatic BAR STRAIGHTENERS

Co-operate:—Refer to The Blast Furnace and Steel Plant

518 KOPPERS OVENS

WERE PLACED IN OPERATION IN
THE U. S. LAST YEAR. BESIDES HAVING AN
ANNUAL CARBONIZING CAPACITY OF

3,400,000 Net Tons of Coal

THESE OVENS CAN RECOVER THE
FOLLOWING BY-PRODUCTS EACH YEAR:—

40,000,000 GALLONS OF TAR

44,000 GALLONS OF MOTOR FUEL

9,500,000 TONS OF AMMONIUM SULPHATE

18,700,000,000 CU. FT. OF SURPLUS GAS

ALL OF WHICH WOULD BE WASTED IF
THE COAL WERE COKED IN BEE-HIVE OVENS

THE KOPPERS COMPANY

PITTSBURGH, PA.

DESIGNERS AND BUILDERS

of

BY-PRODUCT COKE AND GAS PLANTS

Co-operate:—Refer to The Blast Furnace and Steel Plant

TRUTH Needs No Recommendation But Its Own Personality.

"You may be wise, but when you find everybody disagreeing with you it is time to investigate." This is wisdom according to Jim Flint.

Thousands of the most efficient plants in the country use Damascus Bronze Bearings exclusively.



They have discovered by experience that Damascus Bearings are the cheapest in the end because they are the best.

They have also found that what satisfies them to-day can be exactly duplicated next time.

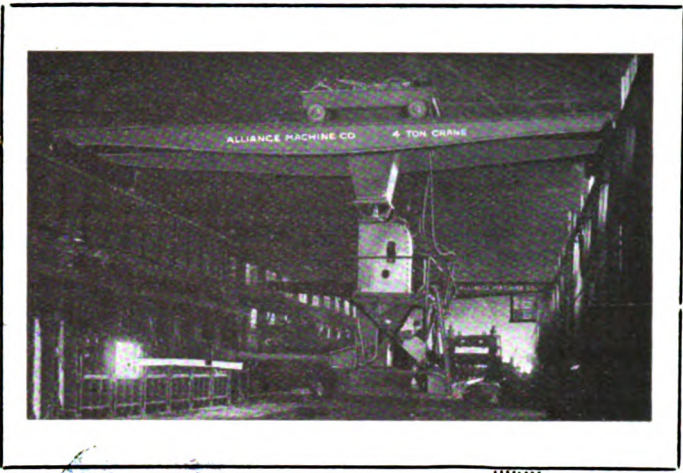
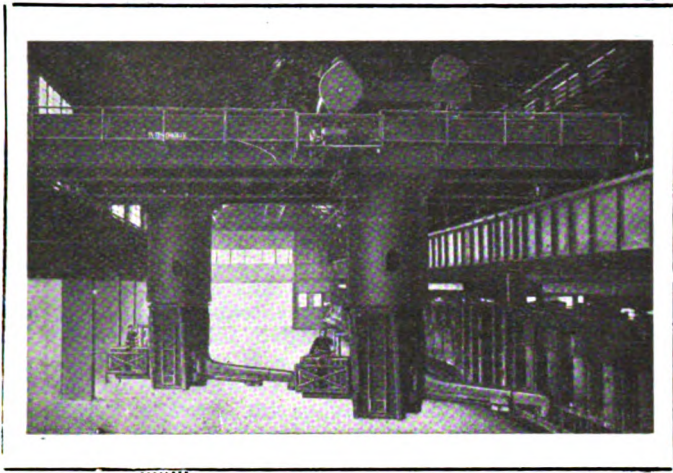
If you are not a user of Damascus Bronze Bearings it must be because you have not tried them.

Let us quote on your specifications and ship you a trial order.

Read Jim Flint's quaint sayings in our monthly magazine, the "Journal of Better Bearings." Send your name and address to be put on the mailing list. It will cost you nothing.

DAMASCUS BRONZE CO.
PITTSBURGH

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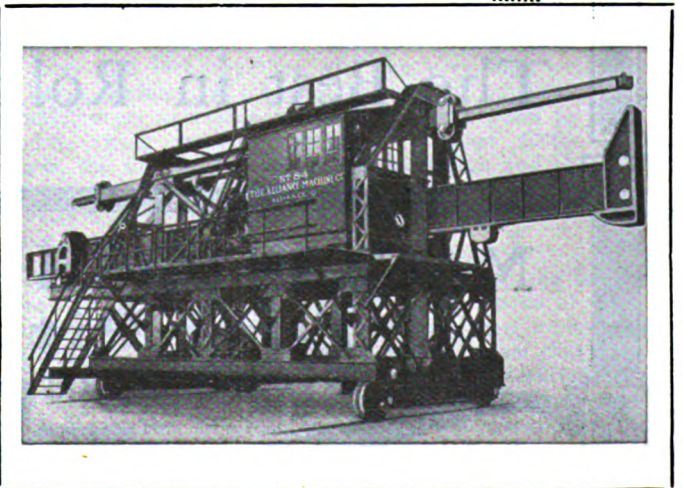
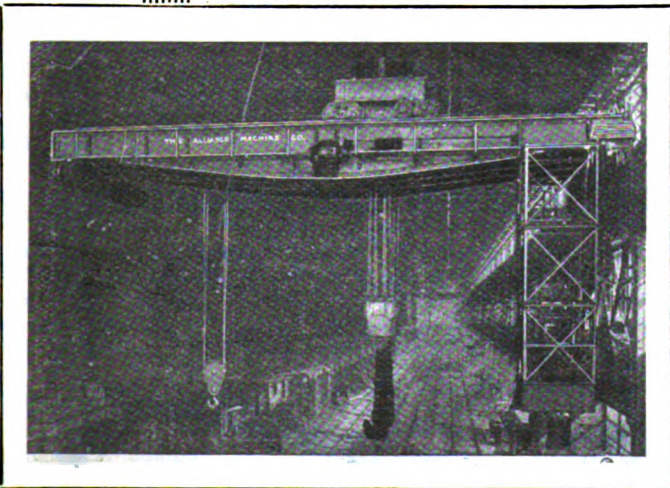
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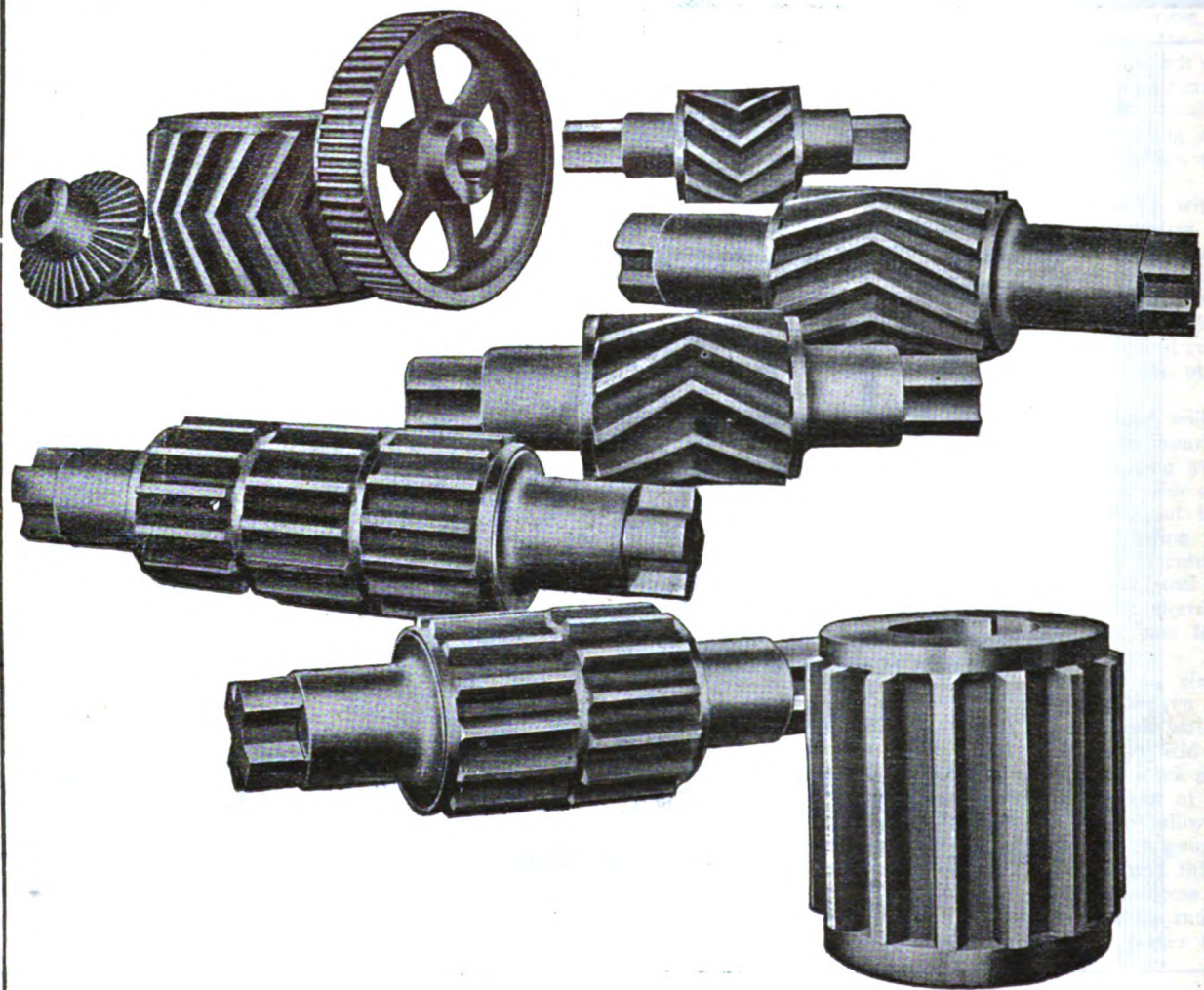
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Fort Pitt Foundry

Pittsburgh, Penna., U. S. A.



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More Than 1000 Air Heads

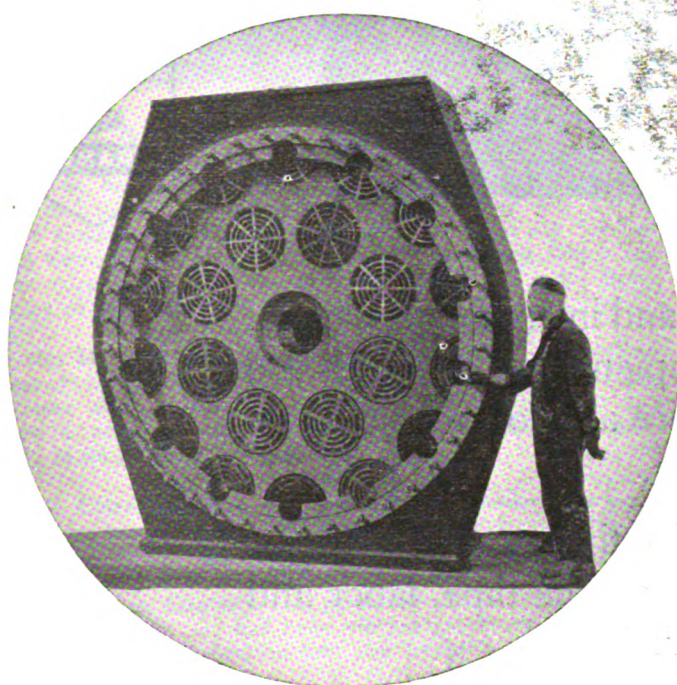
and

20-Different Makes of Blowing Engines

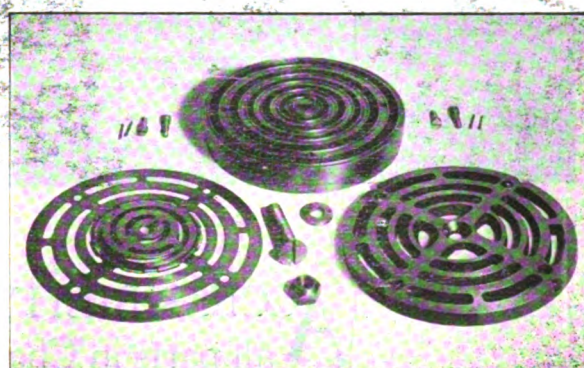
have been equipped with

"Mesta Automatic Plate Valves"

(Iversen Patent)



BLOWING ENGINE AIR HEAD
Equipped With Mesta Automatic Plate Valves.



Seat, Spring, Plate and Guard of
Mesta Automatic Plate Valve.

IF YOU ARE USING ANY
OTHER TYPE OF AIR-
VALVES, IT IS COSTING
YOU MORE TO OPERATE
WITH LESS AIR DE-
LIVERED

YOU CANNOT GET THE MAXIMUM EFFICIENCY
FROM YOUR BLOWING ENGINES WITHOUT THE
MESTA AUTOMATIC PLATE VALVES

Manufactured by

MESTA MACHINE COMPANY
PITTSBURGH **PENNSYLVANIA**

Manufacturers of

Gas and Steam Engines, Blowing Engines, Reversing Engines, Rolling Mill Machinery,
Forging Presses, Gear Drives, Air Compressors, Condensers, Rolls, Pinions, Cut and
Machine Molded Gears, Iron and Steel Castings, Forgings, Forging Ingots, etc.

Co-operate:—Refer to The Blast Furnace and Steel Plant



ACCESSIBILITY and interchangeability of all parts in Champion Cranes assures you of uninterrupted service and low maintenance costs.

You may be surprised at the low operating cost of Champion Cranes and the time, labor and money that can be saved.

Our Engineers will be glad to furnish plans and estimates.

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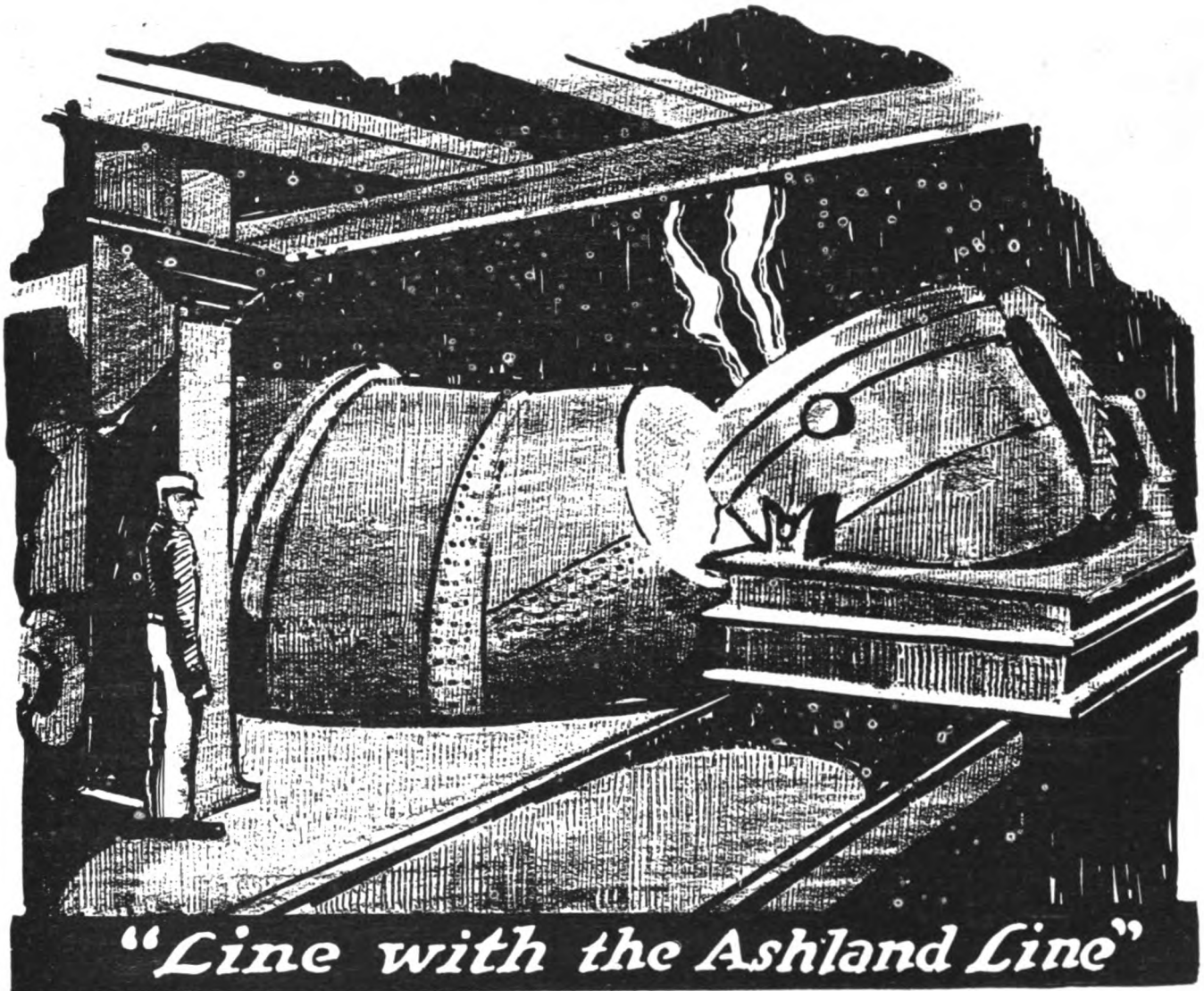
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ASHLAND FIRE BRICK

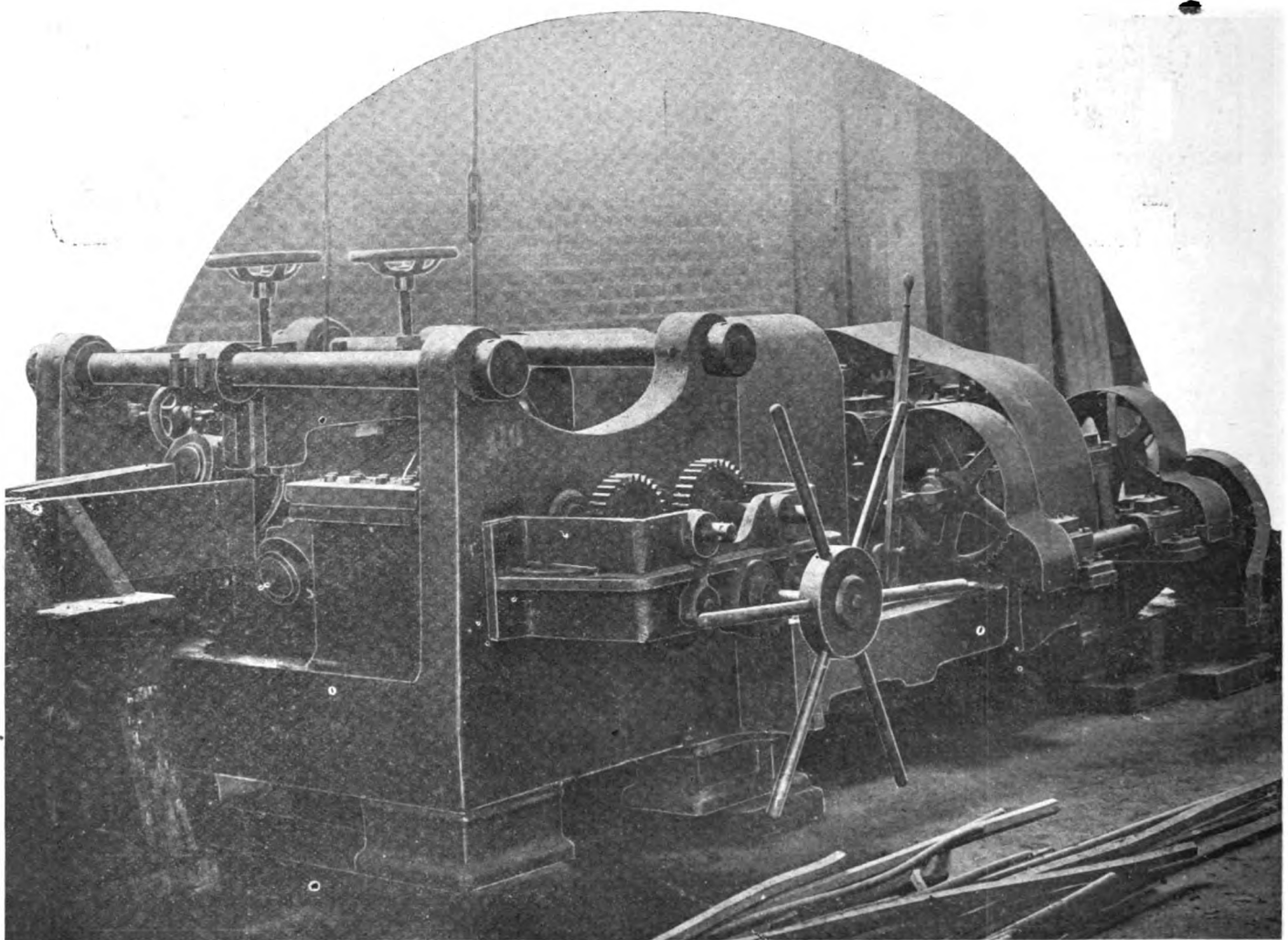
—and in the converter where the heat intensity increases as the air is blown through the iron and deterioration of the lining is rapid from the constant and intense activity of the metal, Ashland Brick have endured and have helped to make converter operation a success. Ashland Brick in all hot metal and furnace equipment means few renewals.

ASHLAND FIRE BRICK CO.
ASHLAND, KY.

Established 1886.



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PROGRESS Simply Means Going Forward To Something Better Every Time Occasion Offers.



Jim Flint says: "The world will not stop moving just because you do not like the direction in which it is moving."

Users of Damascus Mill Bearings have learned by experience that result is efficiency and economy combined.

It stands to reason that bearings which last longest, give most service and have to be replaced least frequently are much cheaper in the end than the trouble making substitutes which cost a few cents less at time of purchase.

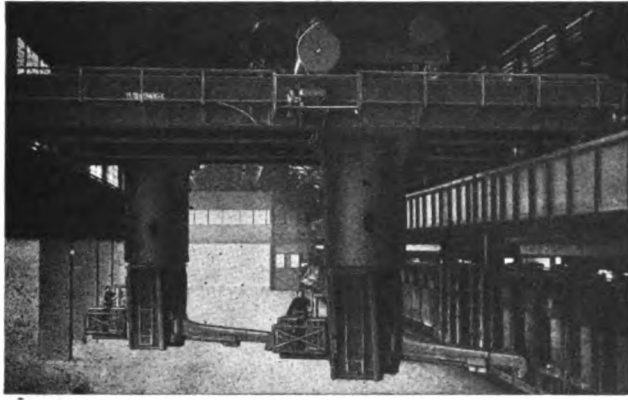
Damascus Mill Bearings recommend themselves wherever tried.

For heavy duty under severest conditions our Nickel Bronze Bearings are the most serviceable. They are made for long wear and reduce lubrication to a minimum.

Read Jim Flint's quaint sayings in our monthly magazine, the "Journal of Better Bearings." Send your name and address to be put on the mailing list. It will cost you nothing.

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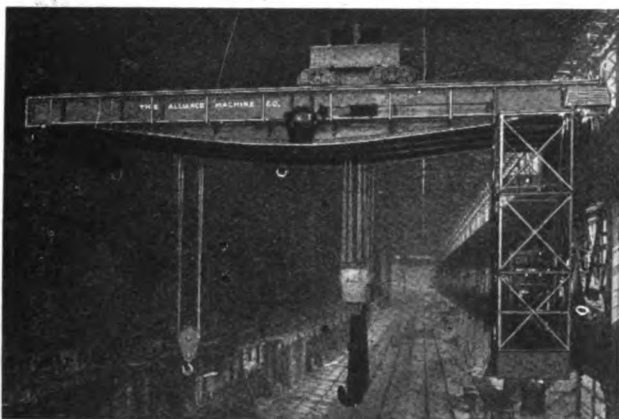
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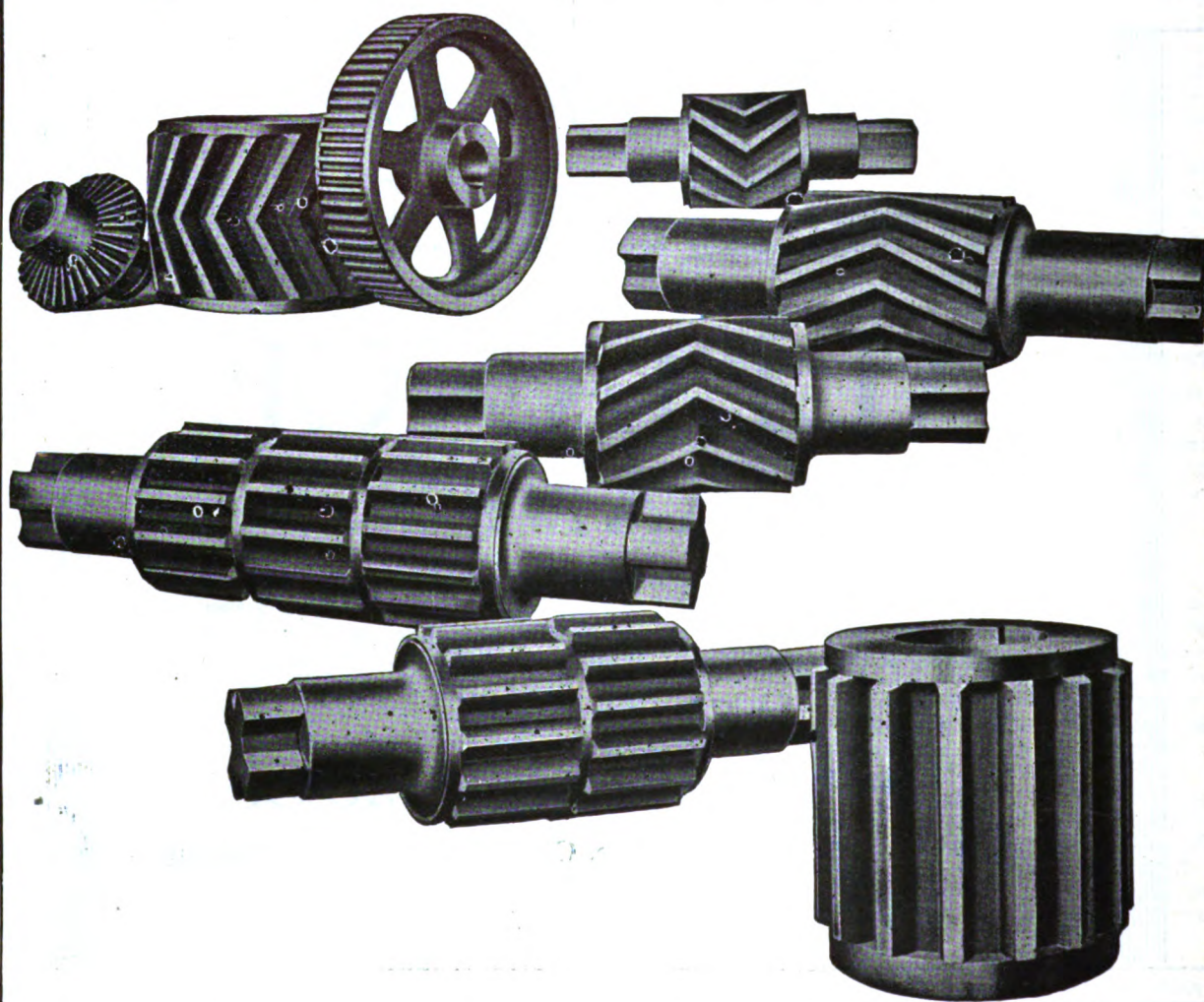
Co-operate:—Refer to The Blast Furnace and Steel Plant

Our Gears and Pinions

Machine Cut or Cast Teeth

Stand First for Accuracy

Strength and Wearing Qualities



The Best in Rolling Mill Machinery

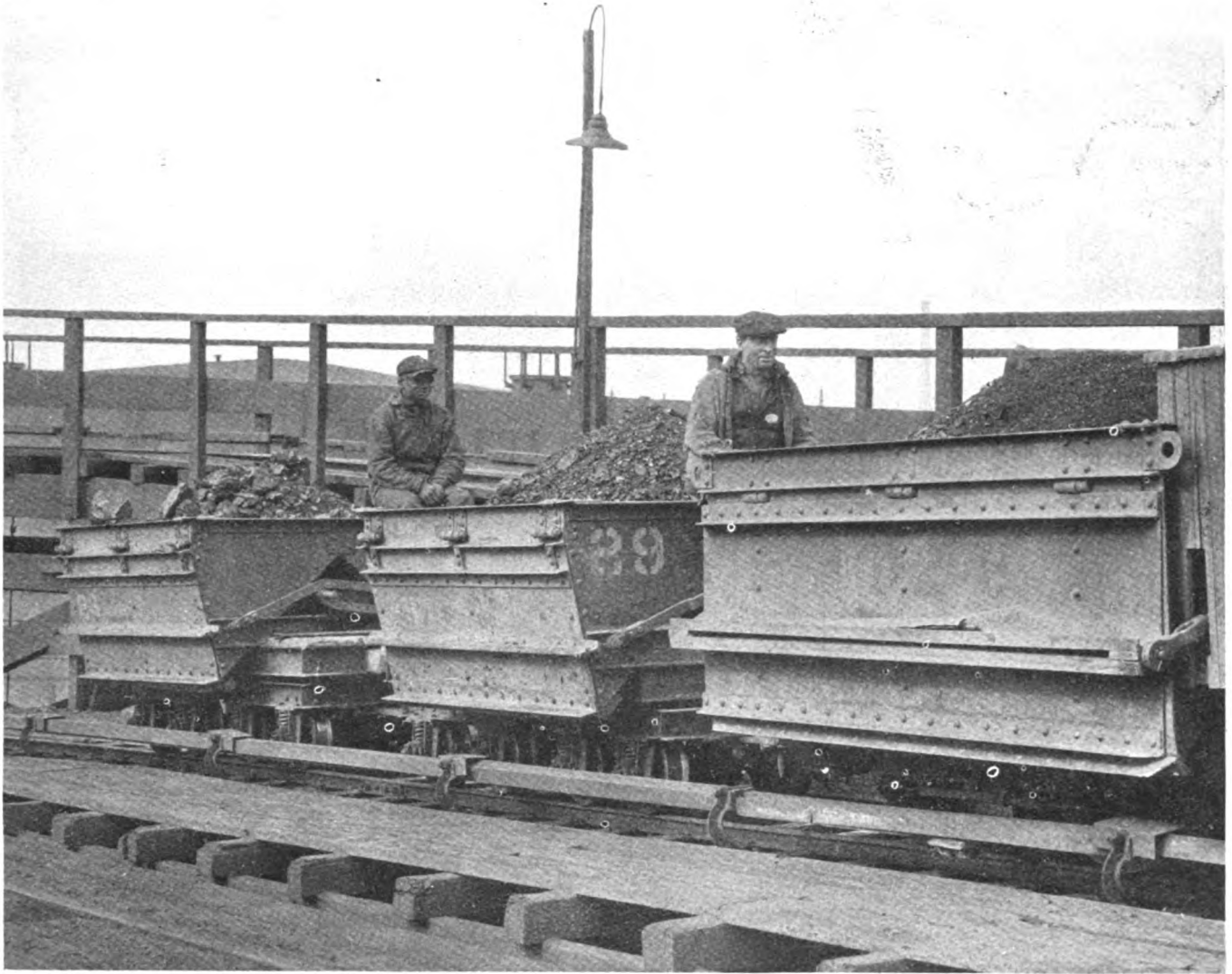
MACKINTOSH-HEMPHILL & CO.

Fort Pitt Foundry

Pittsburgh, Penna., U. S. A.



Co-operate:—Refer to The Blast Furnace and Steel Plant



EASTON CARS "on the job"



EASTON cars stand up under overloads, careless treatment and the elements, alike to the full satisfaction of the equipment boss who wants to make a good showing on his cost sheet, and the gang which is trying to make a record clean-up.

Easton cars work **right** because they're designed by engineers who know from twenty-five years' experience what is needed in a car. They work **long** because they're made of good material by capable workmen. They save money because they fit the job.

Furnishing the right kind of a car is only part of Easton Service. All the rest of an industrial railway's equipment—track, switches, turntables and small parts—are included in Easton facilities.

Let our engineers help you. Their advice is competent—and free.

EASTON CAR & CONST'N CO.



44 Church St., New York

Works: Easton, Pa.

Boston

Chicago

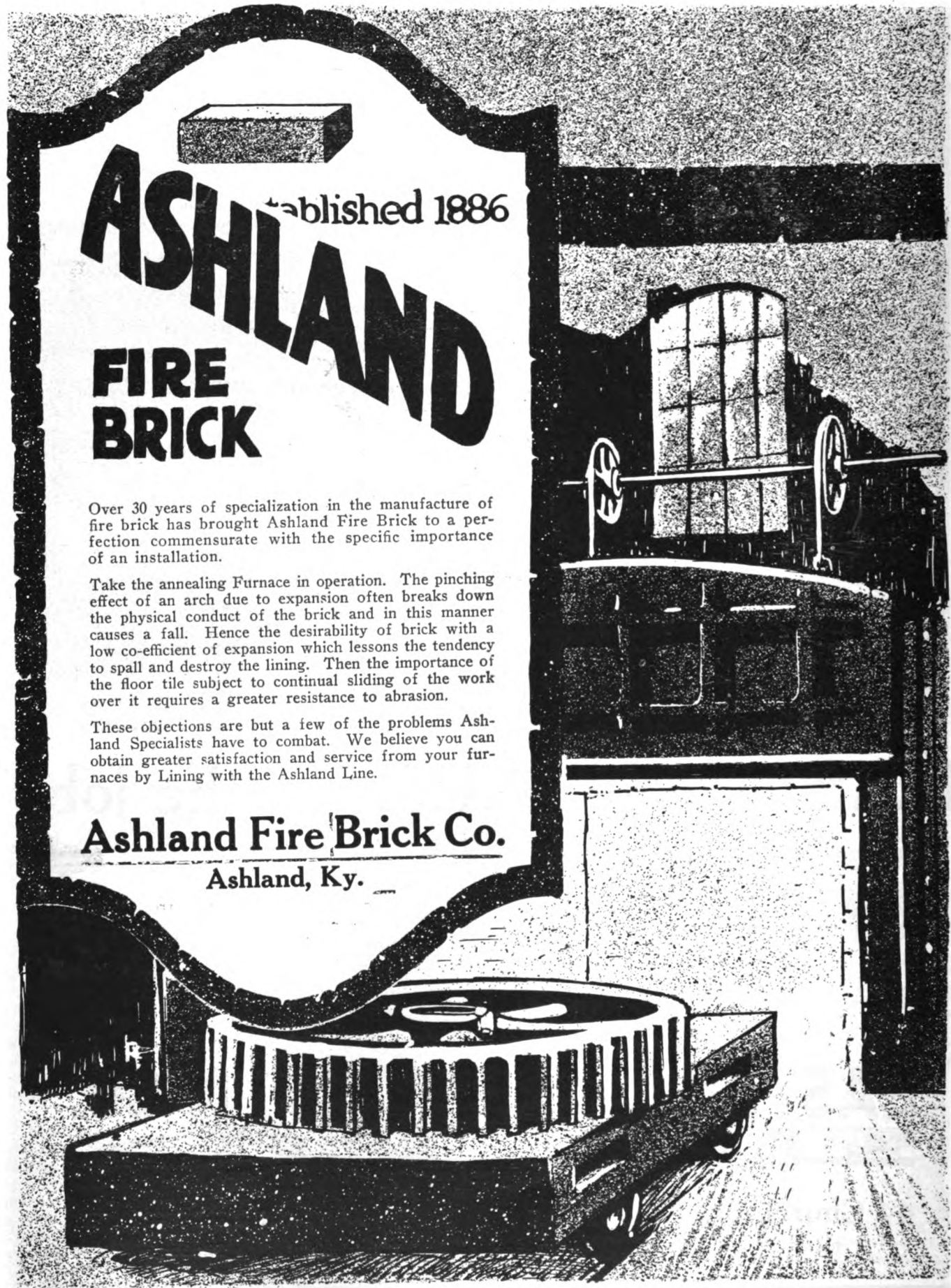
Detroit

Philadelphia

Pittsburgh

2054-E

Co-operate:—Refer to The Blast Furnace and Steel Plant



ASHLAND established 1886
FIRE BRICK

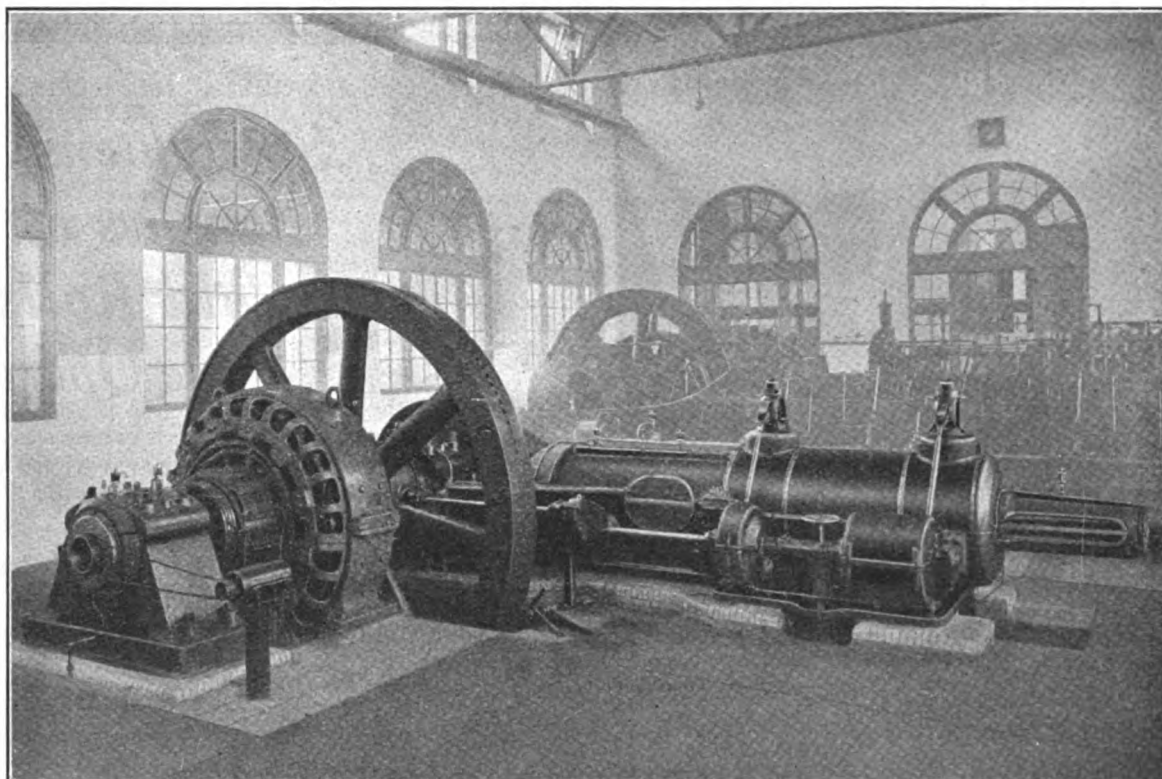
Over 30 years of specialization in the manufacture of fire brick has brought Ashland Fire Brick to a perfection commensurate with the specific importance of an installation.

Take the annealing Furnace in operation. The pinching effect of an arch due to expansion often breaks down the physical conduct of the brick and in this manner causes a fall. Hence the desirability of brick with a low co-efficient of expansion which lessens the tendency to spall and destroy the lining. Then the importance of the floor tile subject to continual sliding of the work over it requires a greater resistance to abrasion.

These objections are but a few of the problems Ashland Specialists have to combat. We believe you can obtain greater satisfaction and service from your furnaces by Lining with the Ashland Line.

Ashland Fire Brick Co.
Ashland, Ky.

Co-operate:—Refer to The Blast Furnace and Steel Plant



28" x 42" Mesta Una-Flow Steam Engine Installed in the Power Plant of the Carnegie Institute of Technology.

MESTA
UNA-FLOW
(STUMPF PATENT)
ARE IDEAL ENGINES FOR ROLLING-MILL SERVICE

BEST AND SAFEST FOR POWER PLANT SERVICE

STEAM-ENGINES

REASONS

Low Steam and Oil Consumption
Reliability in operation
Simplicity in Construction
Steady Regulation

Manufactured by

MESTA MACHINE COMPANY
PITTSBURGH PENNSYLVANIA

Manufacturers of Gas and Steam Engines, Blowing Engines, Reversing Engines, Rolling Mill Machinery, Forging Presses, Air Compressors, Condensers, Rolls, Steel and Iron Castings, Forgings, Forging Ingots, etc.

Co-operate:—Refer to The Blast Furnace and Steel Plant



Straightens, Polishes and Cold-Rolls in One Operation

They are operated by ordinary labor and straighten $\frac{1}{4}$ " to $4\frac{1}{2}$ " bars, from 40 to 80 ft. per minute. Any length bar can be straightened and the maximum

length is determined solely by the space at each end of the machine.

MEDART

Continuous Automatic Bar Straightener

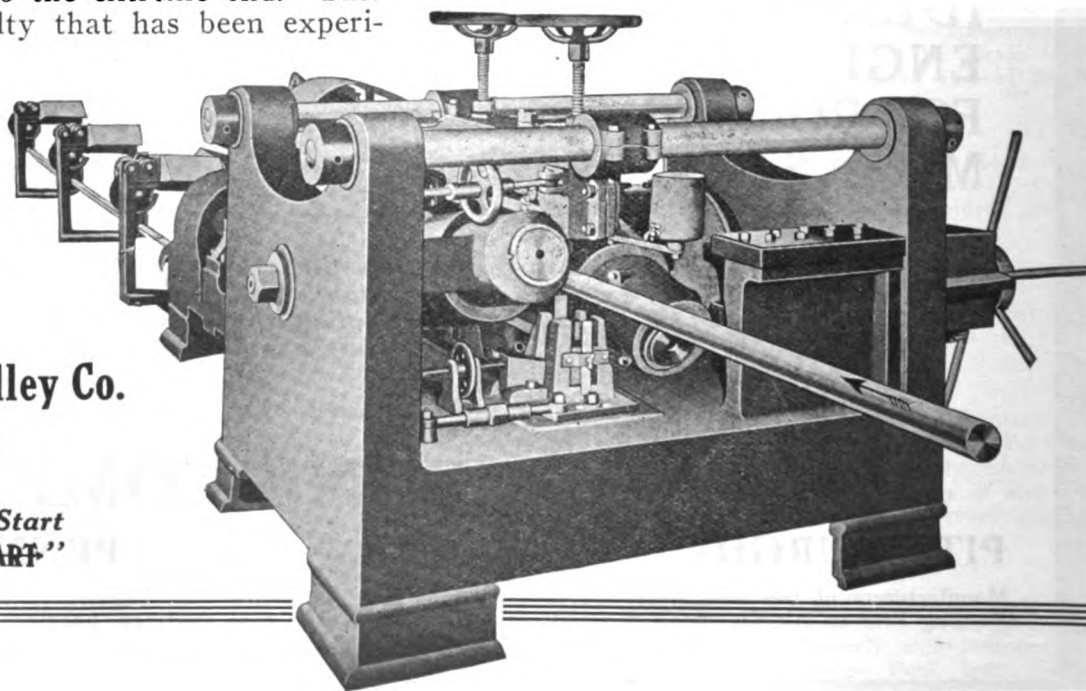
Save time, labor and money for progressive and highly efficient plants by straightening, polishing and cold rolling bars in one operation. Medart Straighteners operate continuously, one bar following another as closely as possible. The entire bar passes through the rolls, which apply full pressure on the bar to the extreme end. This overcomes the difficulty that has been experienced with other machines and removes crooks near the ends of the bars.

Write for our Catalogue on Medart Machines for turning, straightening and polishing Brass, Bronze and Steel Bars.

Medart Patent Pulley Co.

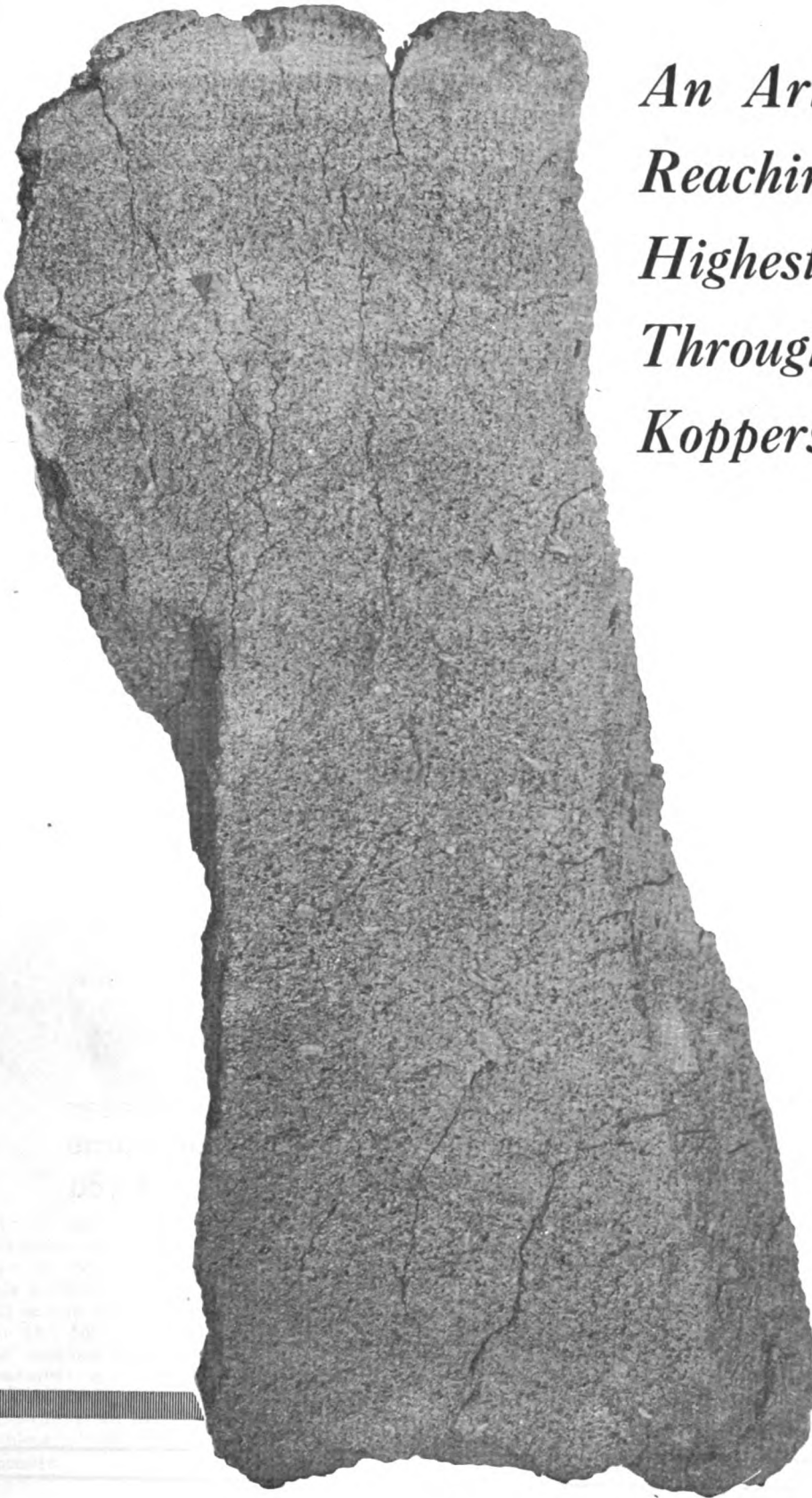
St. Louis, Mo.

*"To get the Right Start
—Equip with MEDART—"*



Co-operate:—Refer to The Blast Furnace and Steel Plant

The Carbonization of Coal



*An Art
Reaching Its
Highest Attainment
Through
Koppers Practice*

**THE
KOPPERS
COMPANY
PITTSBURGH,
PENNA.**

*Designers and Builders of
By-product Coke Plants*

Co-operate:—Refer to The Blast Furnace and Steel Plant

IN GETTING WHAT YOU WANT BE SURE YOU WANT THE BEST.—



Jim Flint says: "Fighting against circumstance is a hard battle; but be sure it is not a traitorous character of your own rather than an outside enemy that is bothering you."

Trouble with Mill Bearings is often caused by the use of inferior brasses which are attractive because of the cheapness of first cost. They are the most expensive in the end for they endure but for a limited time.

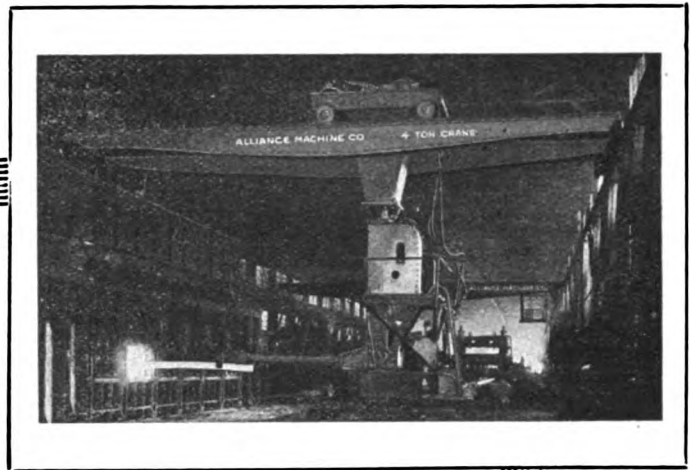
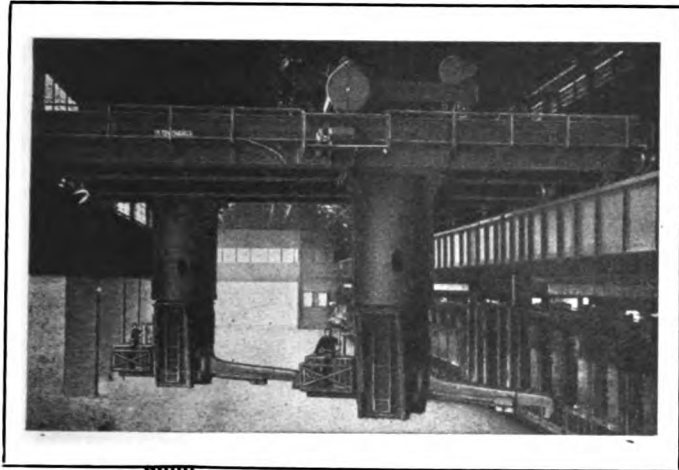
DAMASCUS MILL BEARINGS
are made from pure virgin metal, melted and poured with scientific precision by expert workmen who are supplied with perfect appliances and conditions. Therefore, Damascus Bearings give longest service under most trying conditions with minimum of friction. This reduces lubrication cost.

All Damascus Bearings are manufactured especially for particular use. Tell us your working conditions and we will recommend the right kind for your purpose.

Read Jim Flint's quaint sayings in our monthly magazine, the "Journal of Better Bearings." Send your name and address to be put on the mailing list. It will cost you nothing.

DAMASCUS BRONZE CO.
PITTSBURGH

Co-operate:—Refer to The Blast Furnace and Steel Plant



The Cranes For Service

In addition to our line of Standard Cranes for every service from 5 to 200 tons capacity, we build more large and special types than all others combined. There is nothing in crane building too large or difficult for us to make.

ALLIANCE CRANES

are the result of our vast experience in handling the difficult and unusual installations in the steel industry. The design and construction of Alliance Cranes, together with mechanical leadership and high grade workmanship have made us the largest manufacturers of the world's largest cranes.

Write and tell us your problems.

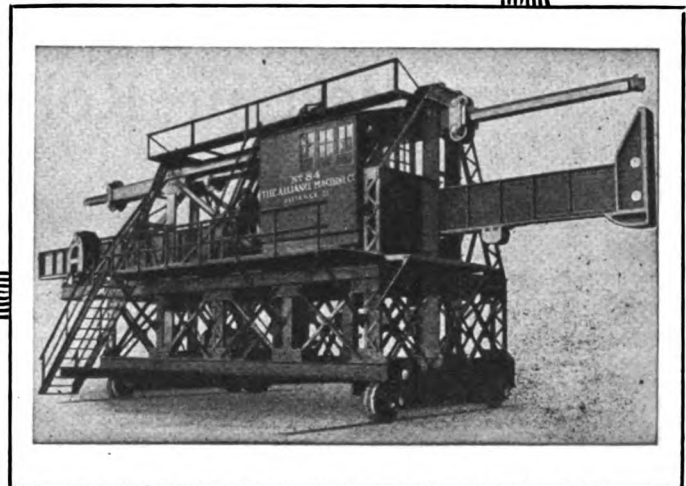
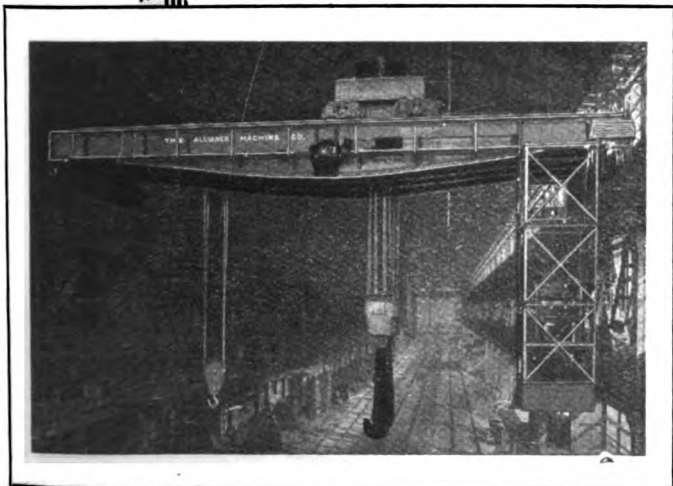
The Alliance Machine Co.

Pittsburgh

Alliance, Ohio.

Birmingham

The World's Largest Builders of the World's Largest Cranes.



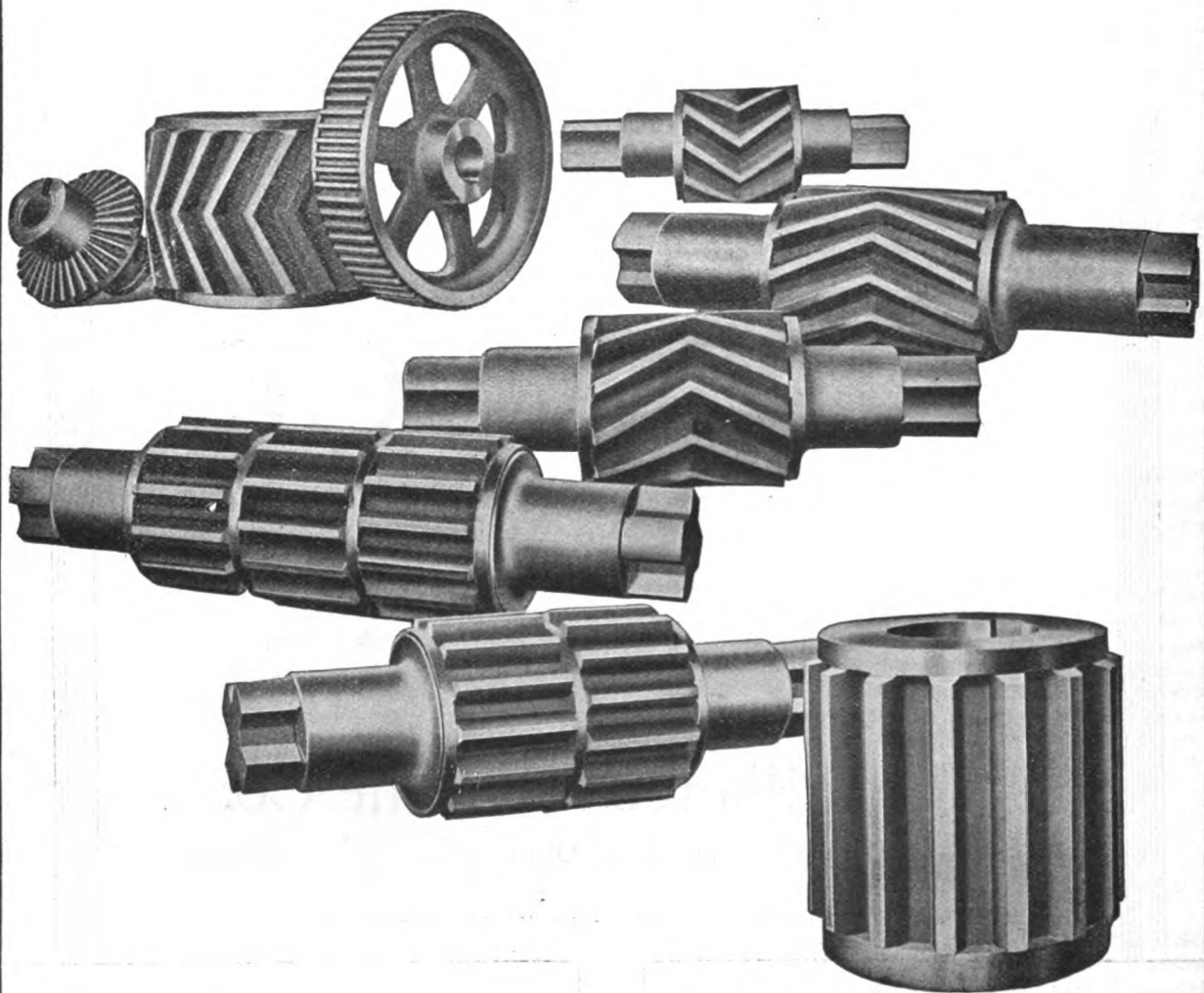
Co-operate:—Refer to The Blast Furnace and Steel Plant

Our Gears and Pinions

Machine Cut or Cast Teeth

Stand First for Accuracy

Strength and Wearing Qualities



The Best in Rolling Mill Machinery

MACKINTOSH-HEMPHILL & CO.

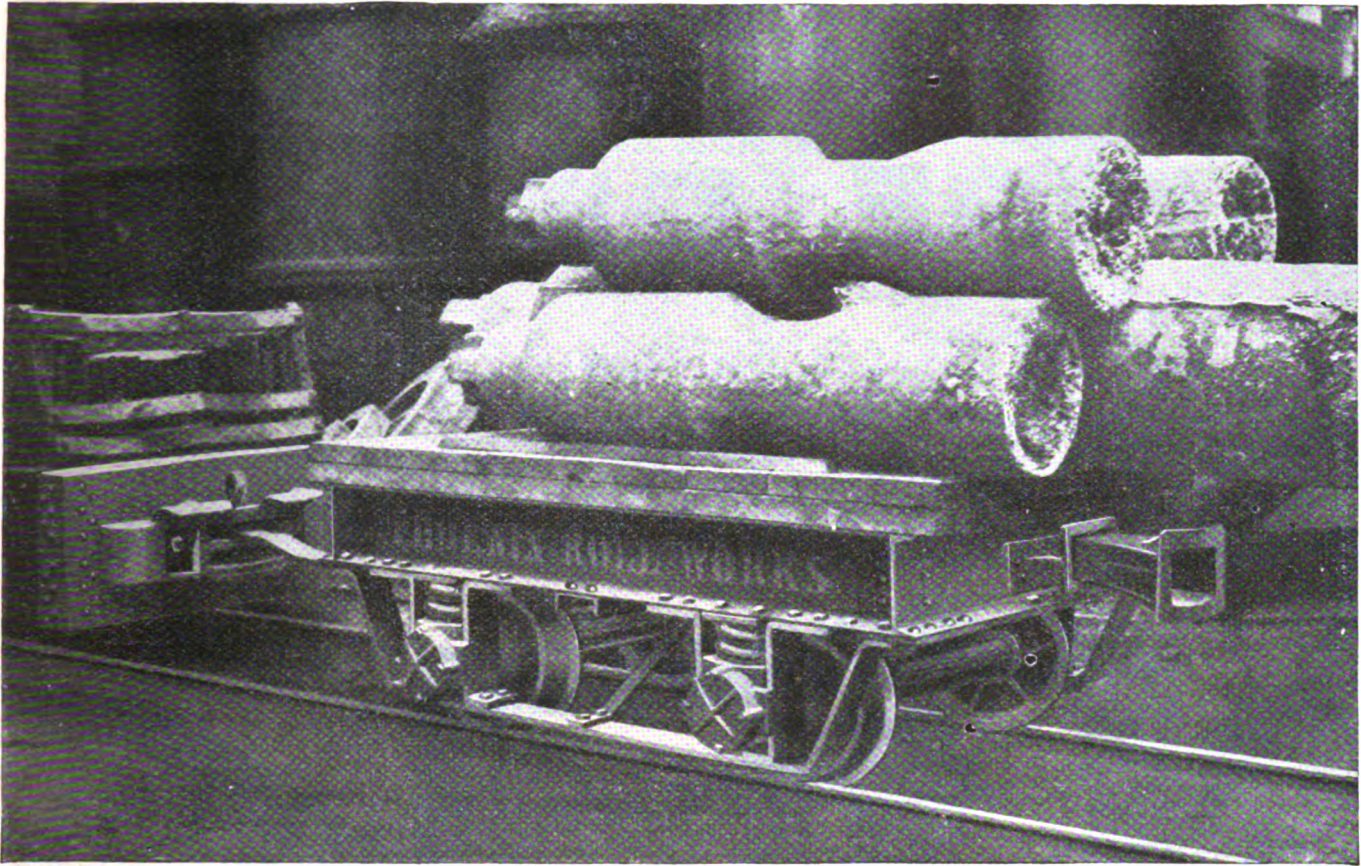
Fort Pitt Foundry

Pittsburgh, Penna., U. S. A.



Co-operate:—Refer to The Blast Furnace and Steel Plant

EASTON CARS "on the job"



When the usual plant loads are heavy, the sturdy running gear and easy traction of Easton cars lessen maintenance and motor bills.

Easton roller bearings cut in half the tractive force required to move a car. The high grade cast-iron box is dust-proof and, through the design of the wrought-iron supports, has floating vertical and side play which makes the wheels self-adjusting to loading shocks or any track irregularity. The tie-bar adds to the strength of the equipment.

But cars—of every style and description—are only part of Easton industrial railway service. Easton engineers have had twenty-five years' experience in designing every detail of industrial railway systems; and Easton facilities can furnish cars, locomotives, track, switches, turntables, and all minor equipment best suited to the particular installation.

Ask our engineers for recommendations on your plant layout. You incur no obligation—and the assistance will be considerable.

EASTON CAR & CONST'N CO.



44 Church St, New York

Works: Easton, Pa.

Boston

Chicago

Detroit

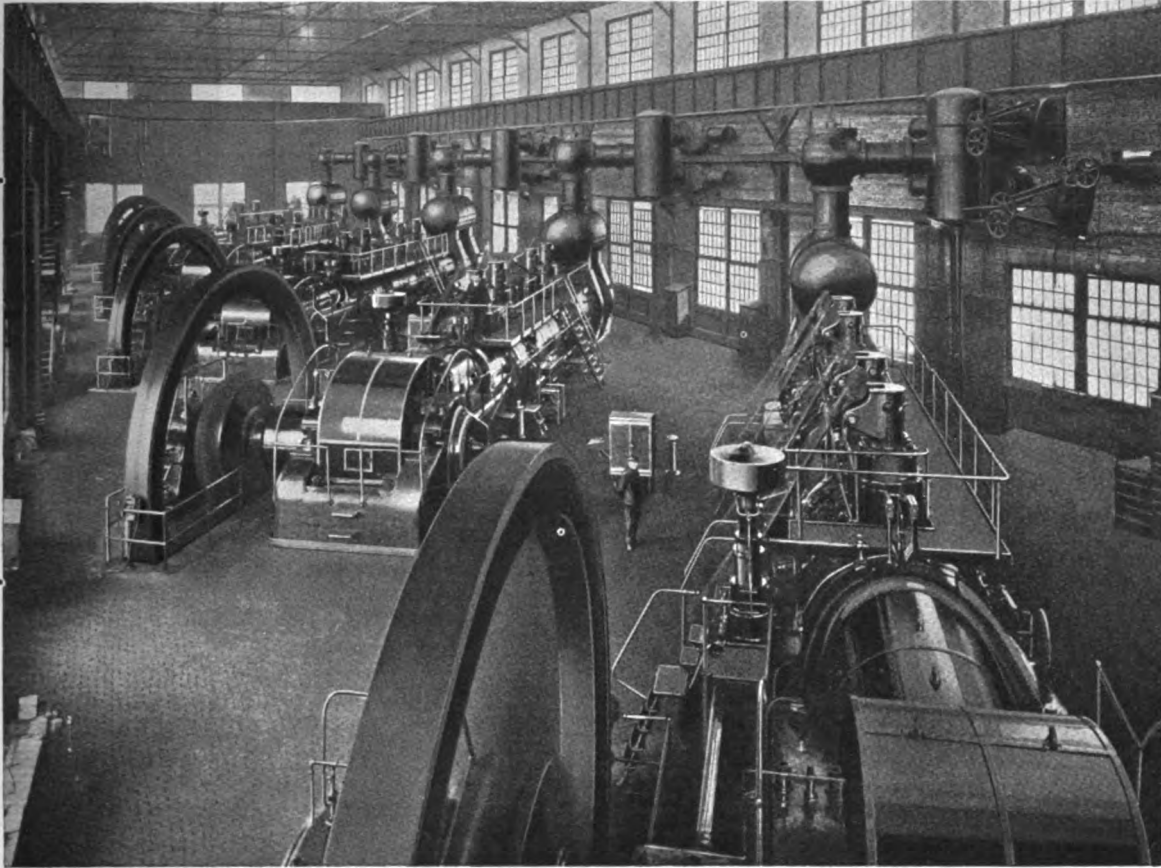
Philadelphia

Pittsburgh

2065-Y

Co-operate:—Refer to The Blast Furnace and Steel Plant

MESTA GAS BLOWING ENGINES



Installation of Five Mesta Single Tandem Gas Blowing Engines at the Lackawanna Steel Co.

UTILIZE YOUR BLAST FURNACE GAS TO THE BEST ADVANTAGE

Four Single Engines, as Illustrated above, Operating at a Speed of 60 to 65 R. P. M., Will Serve Two 500-Ton Blast Furnaces.

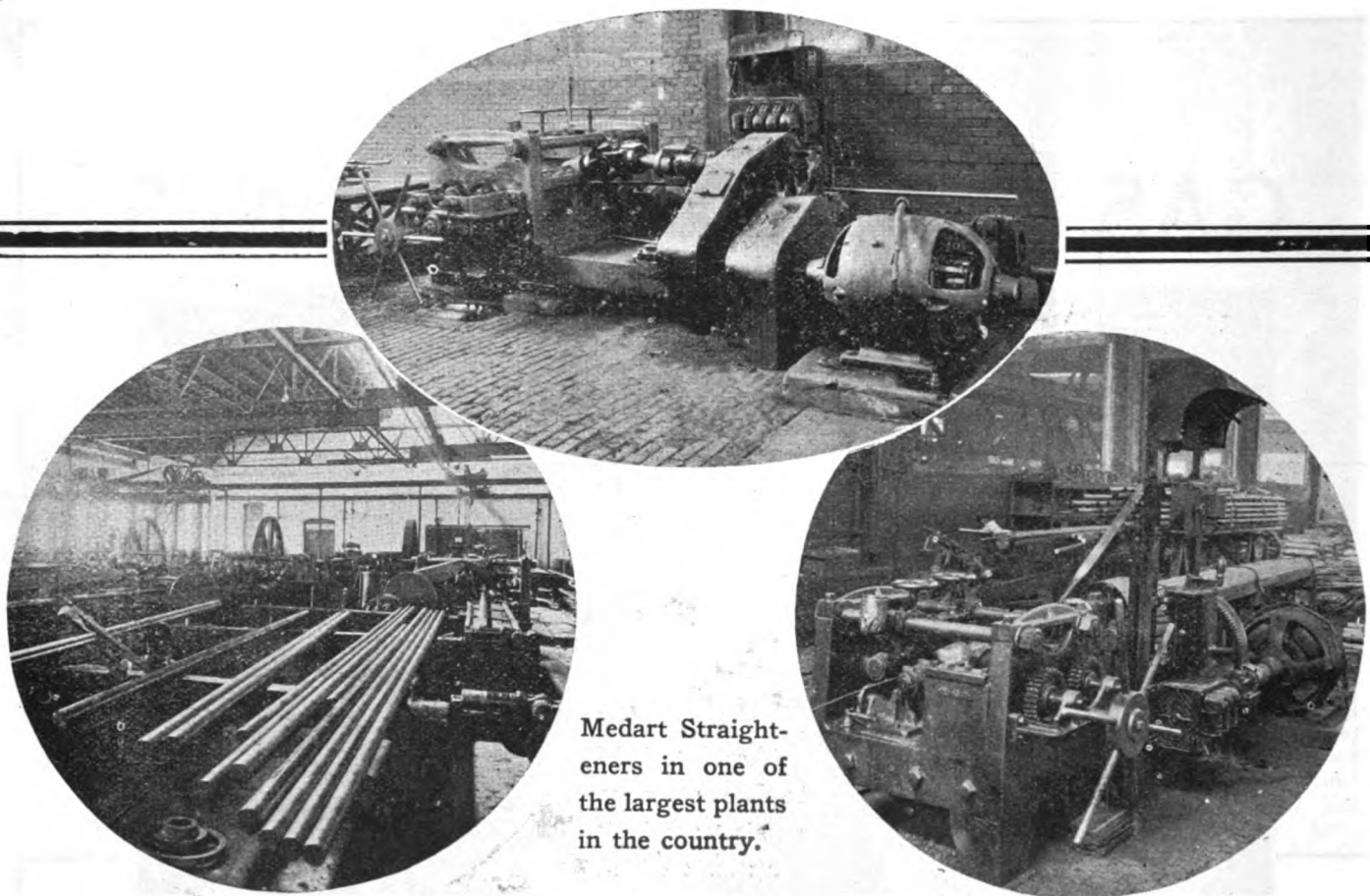
The Fifth Engine Is Held in Reserve.

For reliability and ease of operation, Mesta Gas Engines are equivalent to any steam driven unit.

Manufactured by

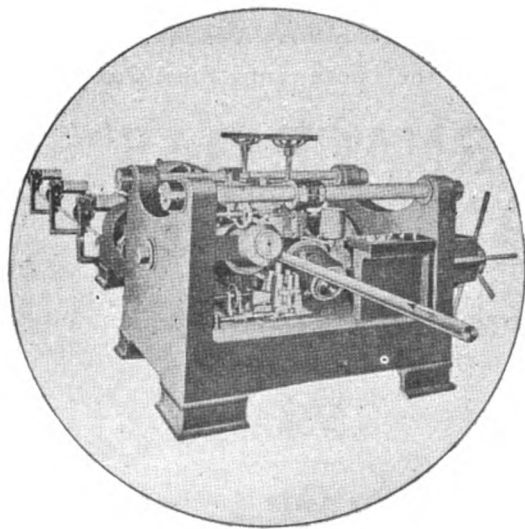
MESTA MACHINE COMPANY
PITTSBURGH PENNSYLVANIA

Co-operate:—Refer to The Blast Furnace and Steel Plant



Medart Straighteners in one of the largest plants in the country.

*To get the right start
—Equip with ~~MEDART~~*



MEDART

Continuous Automatic BAR STRAIGHTENERS

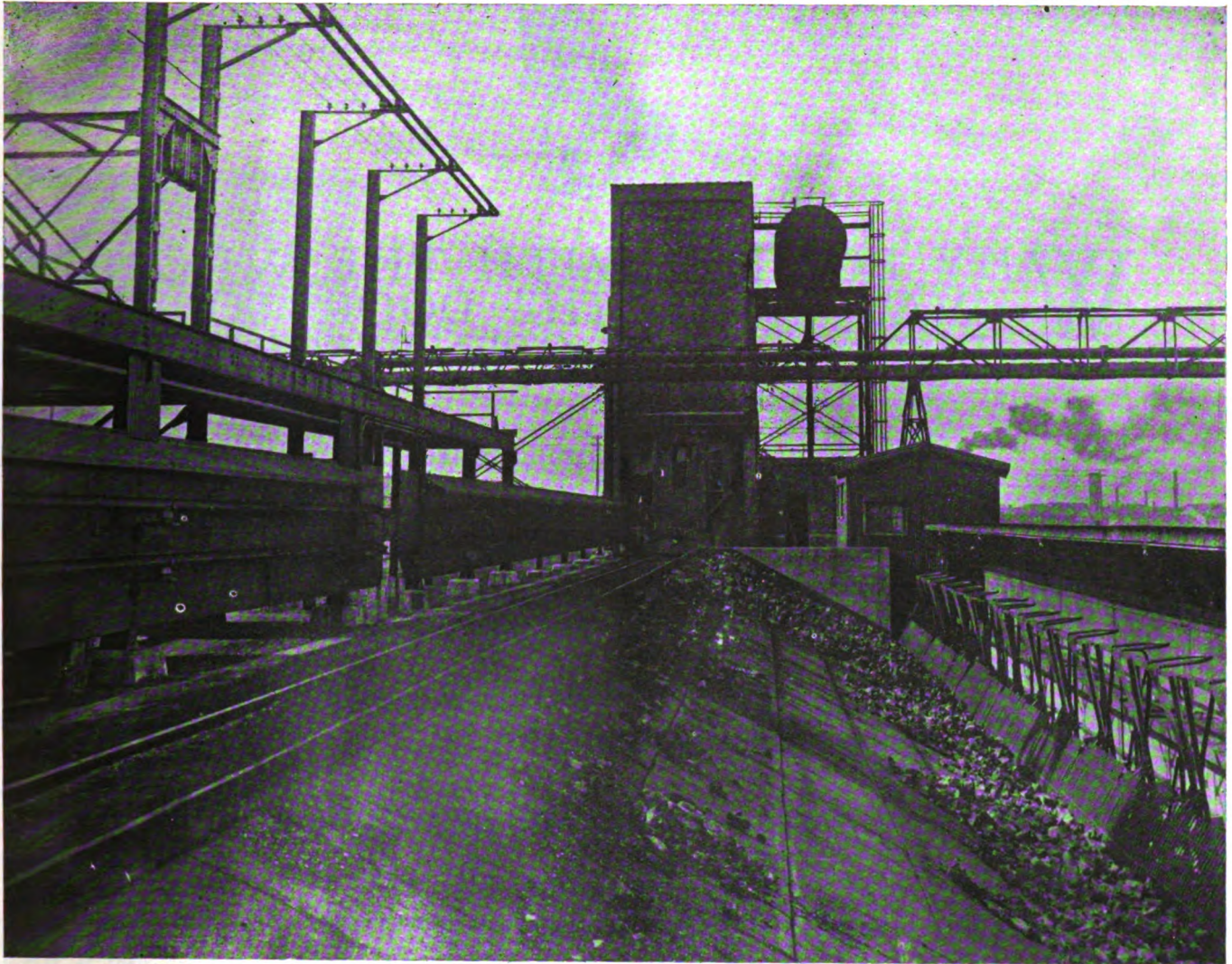
are installed in some of the largest steel plants of the country. That they are giving satisfaction is evidenced by the fact that in nearly every instance, orders for additional machines have been received after the original order was installed. The illustration above shows three of MEDARTS doing service at the world famous plant of the BETHLEHEM STEEL COMPANY, at Bethlehem, Penna.

These machines are operated by ordinary labor and are cutting straightening cost by straightening, polishing, and cold rolling in one operation. MEDART STRAIGHTENERS operate continuously and will straighten any length bar diameter 1/16" to 6 from 40 to 80 feet per minute.

Let us tell you more about MEDART STRAIGHTENERS.

MEDART PATENT PULLEY COMPANY
St. Louis, Missouri.

Co-operate:—Refer to The Blast Furnace and Steel Plant



Coke Wharf and Quenching Station at By-Product Coke Plant of Dominion Iron & Steel Company, Ltd., Sydney, Nova Scotia.

DOMINION IRON & STEEL CO., Ltd., has awarded the contract for its new battery of sixty by-product coke ovens. This installation is an addition to the existing plant of 120 Koppers ovens placed in operation in 1918 and which has exceeded in every respect the guarantees given and the expectations of the customer.

THE KOPPERS COMPANY

PITTSBURGH, PA.

Designers and Builders of By-Product Coke Plants

Co-operate:—Refer to The Blast Furnace and Steel Plant



WHY BOTHER WITH THE WRONG WAY WHEN THE DOOR TO THE RIGHT STANDS OPEN BEFORE YOU?



Jim Flint says: "Common sense pays better dividends than preferred piffle."

Herein is reason. It explains why hundreds of users of mill bearings, over all the United States refuse to be led astray by the allurements of cheap brasses.

Cheap? Nothing is cheap that causes delay and expense by failing to come up to expectations.

DAMASCUS BRONZE BEARINGS

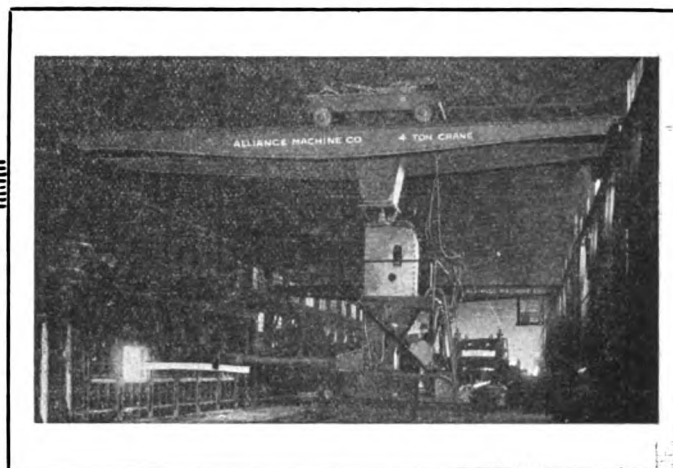
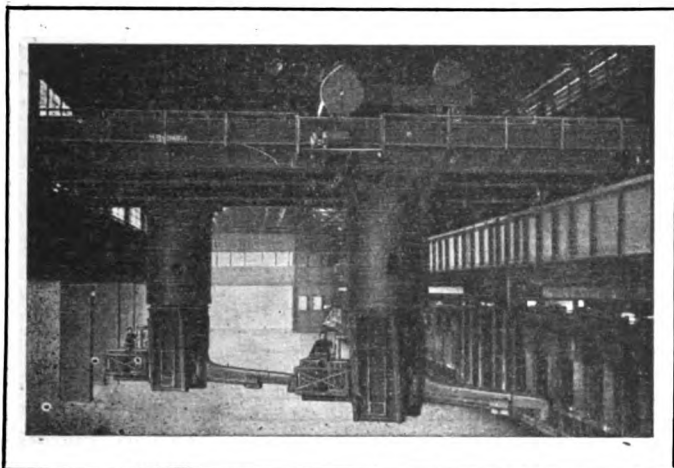
are reliable. You know just what to expect from them and they never disappoint. They are made right by workmen who know how to make them and they are made to suit your individual working conditions.

If you are already a user of Damascus Bearings no more need be said. If you are not, all we ask is your trial order that you may be convinced of their superiority.

Read Jim Flint's quaint sayings in our monthly magazine, the "Journal of Better Bearings." Send your name and address to be put on the mailing list. It will cost you nothing.

DAMASCUS BRONZE CO.
PITTSBURGH

Co-operate:—Refer to The Blast Furnace and Steel Plant



The Cranes For Service

In addition to our line of Standard Cranes for every service from 5 to 200 tons capacity, we build more large and special types than all others combined. There is nothing in crane building too large or difficult for us to make.

ALLIANCE CRANES

are the result of our vast experience in handling the difficult and unusual installations in the steel industry. The design and construction of Alliance Cranes, together with mechanical leadership and high grade workmanship have made us the largest manufacturers of the world's largest cranes.

Write and tell us your problems.

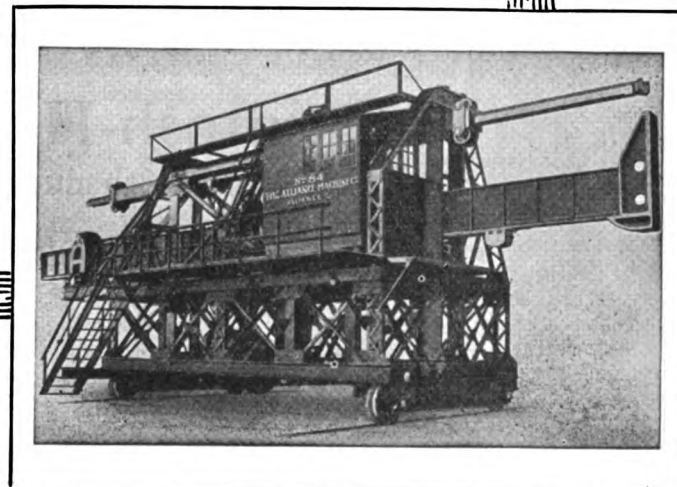
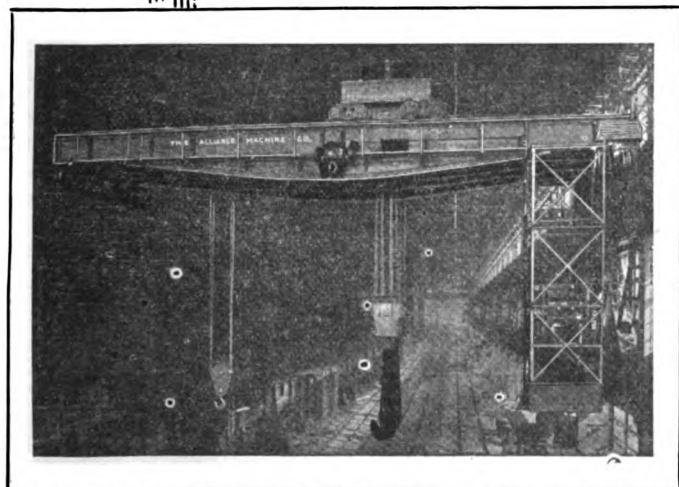
The Alliance Machine Co.

Pittsburgh

Alliance, Ohio.

Birmingham

The World's Largest Builders of the World's Largest Cranes.



Co-operate:—Refer to The Blast Furnace and Steel Plant

FOR SALE

*New Rolling Mills
as follows:*

One (1)—10" Mill—
Five Stands

One (1)—8" Mill—
Two Stands

Complete with very latest type housings—top and bottom screws, etc.; pinions double helical cut teeth run in oil.

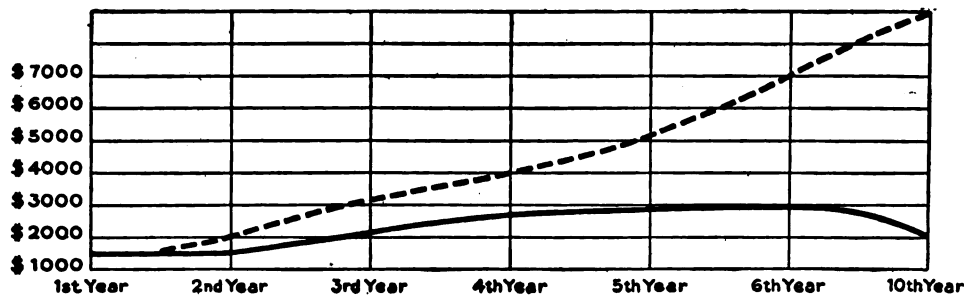
These mills ready for immediate delivery.

*Full information and inspection
upon request*

Mackintosh-Hemphill Company

12th and Etna Streets
Pittsburgh, Pennsylvania

Co-operate:—Refer to The Blast Furnace and Steel Plant



Which Is Your Efficiency Line?

The full line in the chart above shows the usual progress of the average man who takes up work in the power plant. From helper, water tender or fireman up to engineer—but there he usually stops. Study the full line carefully.

Now what does the dash line show? Same start as helper, water tender or fireman up to engineer—but instead of following a horizontal line for many years it starts moving up into the \$4,000 to \$7,000 class very quickly.

What Has Happened?

The full-line man has been content to work along following the bitter route of experience and trusting to luck to make such progress as he could.

The dash-line man, however, saw a real opportunity from a fuel conservation standpoint. He realized that the largest item of expense at the plant was fuel, and right there lay wide open the avenue for success. He used his spare time to get information on fuel conservation—combustion—and has become a Combustion Expert. His services are in demand at a large salary at any time. How to get the training in Combustion Engineering without leaving one's work has, however, up to this time been quite a problem for the average man.

Learn Combustion the New Way

Conditions have changed considerably in the last few years. Economy

in handling fuel is more necessary today than it ever has been. There are unlimited opportunities at the present time for the man who will learn good boiler room practice and obtain a better knowledge of combustion.

For the first time you have the opportunity of obtaining a thorough knowledge of combustion thru a non-resident Course, written in simple, everyday language—easy to understand—and completely illustrated in an interesting as well as an instructive way.

The Educational Staff

The leading authorities on Combustion have prepared and are directing this easy reading Course. Joseph W. Hays, Author and Educational Director, is widely known as one of the leading contributors to the literature of the subject. The educational staff of reviewing and advisory editors includes the best known men in the combustion field, all specialists and authorities on Combustion Engineering and Plant Management.

They are Arthur L. Rice, Editor of Power Plant Engineering; David Moffat Myers, Advisory Engineer for the U. S. Fuel Administration; W. L. Abbott, Chief Operating Engineer of the Commonwealth Edison Co. of Chicago; Fred R. Low, Editor of Power; Prof. S. W. Parr, Department of Chemistry, University of Illinois; Joseph Harrington, formerly Administrative Engineer, U. S. Fuel Administration, and I. E. Moulthrop, Construction Bureau, Edison Electric Illuminating Company.

Spare Time Only Necessary

No technical education is needed to understand the Hays Course and

Service. It requires only an average of one-half hour daily of your spare time to complete it on the regular schedule. The enrollment fee is very reasonable and easy terms of payment are allowed, if necessary.

The Course has been highly endorsed by leading engineering firms thruout the country, who have recommended the Course to their employees, and in a number of plants as many as fifteen to twenty men are enrolled.

Send for Free Book—"Opportunities for the Combustion Expert"

For the man who wants to forge ahead in the combustion field—who wants to change from a full-line to a dash-line man—we have prepared a handsome and interesting book, "Opportunities for the Combustion Expert." A copy will be sent free upon request.

It points out how in a very short time you can master the Hays Course and become a Combustion Expert with a considerably larger salary. Return coupon below today. Hays School of Combustion, Dept. 76, 1412-14 S. Michigan Avenue, Chicago, Ill.

Send for Free Book—"Opportunities for the Combustion Expert."

Name

Address

City

State

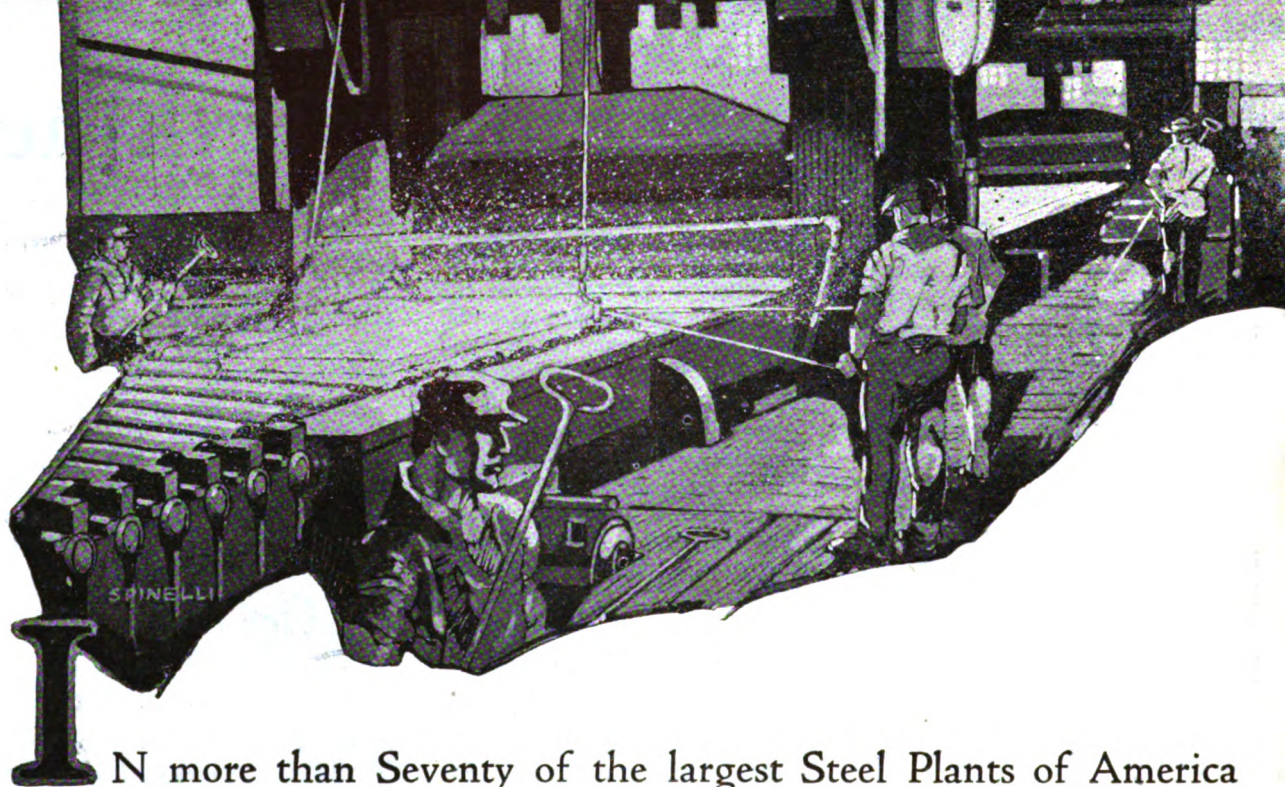
Position

With
(Name of Company)

Hays School of Combustion
Dept. 76, 1412-14 S. Michigan Ave.
Chicago, Illinois

Co-operate:—Refer to The Blast Furnace and Steel Plant

Service The Acid Test



IN more than Seventy of the largest Steel Plants of America

PROMET the Heat-Treated Bearing Metal

is recognized as ideal for Rolling Mill Service.

We are adding to our list of Steel Plant customers at the rate of one a day. It is your turn next!

Of course there are reasons for this acknowledged supremacy of PROMET in Rolling Mill service.

PROMET differs entirely both in structure and properties from any other metal. It possesses unequalled bearing and lubricating properties. It is absolutely fool-proof and failure-proof. Its unique properties are permanent and cannot be destroyed by severe usage, unskilled handling, or any conditions of storage. It cannot stick to, or injure, the neck of your rolls.

PROMET is guaranteed to reduce your bearing costs per ton.

The PROMET Book, *The Restoration of a Lost Art*, is a liberal education in bearings. Have you asked for your copy?

Address enquiries to Steel Plant Division

THE AMERICAN CRUCIBLE PRODUCTS COMPANY
ELYRIA, OHIO

BRANCH OFFICES:

Birmingham, Ala.; Boston; Buffalo; Chicago; Cleveland; Dallas; Jacksonville, Fla.; Los Angeles; Louisville; Montreal; New Orleans; New York; Oakland, Calif.; Pittsburgh; St. Louis; Seattle; Washington, D. C.

Co-operate:—Refer to *The Blast Furnace and Steel Plant*



EASTON CARS "on the job"



If you would improve the transportation methods of your own organization our service is at your disposal.

For transporting materials within the limits of grounds and buildings no method is more serviceable than that provided by an Easton Industrial Railway.

Efficient, fast, easily operated and economically maintained, it is the ideal form of internal transportation for large industries.

If adapted to the exact requirements of your own plant, an Easton Railway will bring all manufacturing departments closer together, promote intelligent co-operation and speed up work all along the line.

EASTON CAR & CONST'N CO.



54 Church St., New York

Works: Easton, Pa.

Boston

Chicago

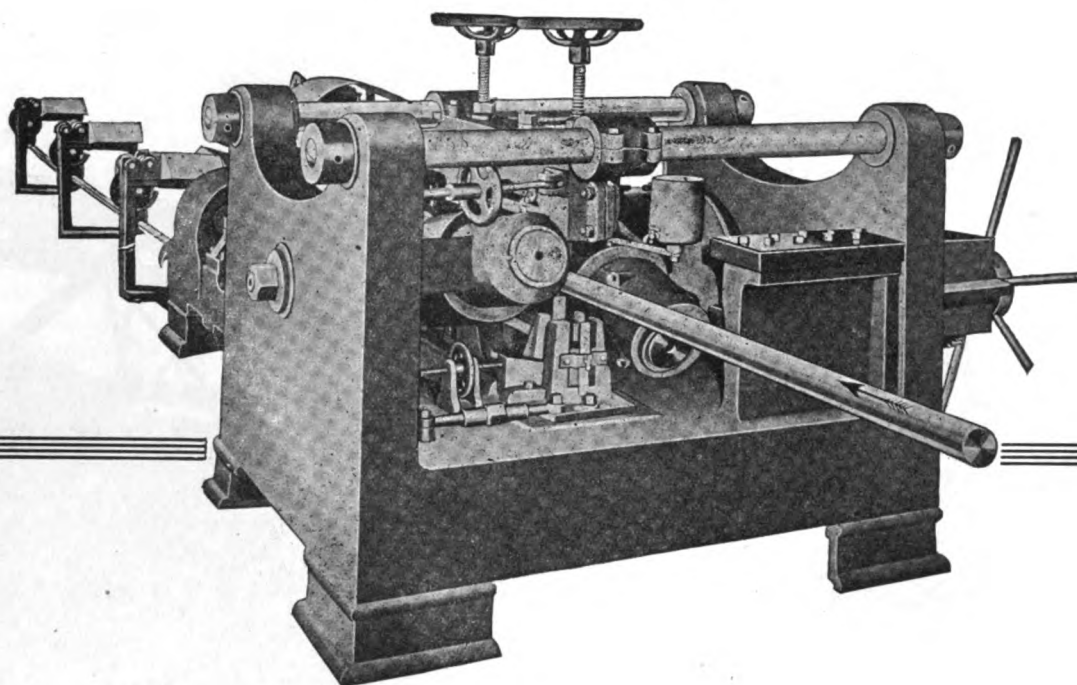
Detroit

Philadelphia

Pittsburgh

2037-E

Co-operate:—Refer to The Blast Furnace and Steel Plant



MEDART STRAIGHTENERS HANDLE BARS FROM 40 TO 80 FEET PER MINUTE

Production is today's slogan and

MEDART

**Continuous
Automatic**

Bar Straighteners

are production boosters in many progressive plants engaged in bar products, straightening, polishing and cold rolling in one operation. This is accomplished with ordinary labor.

No limit confines the length of bars handled on a Medart as bars of great length can be straightened as easily as short ones, the only requirement being that ample space is provided at the ends of the machine.

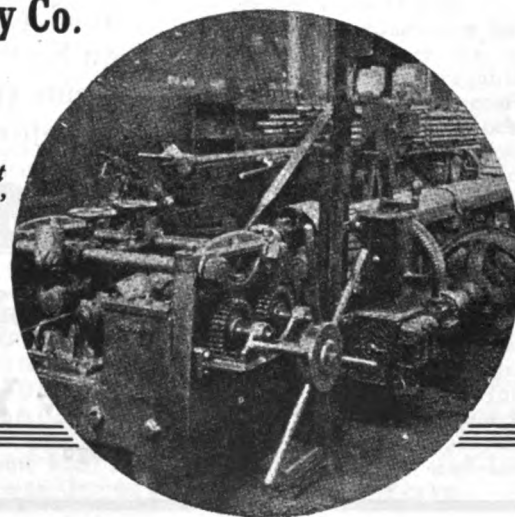
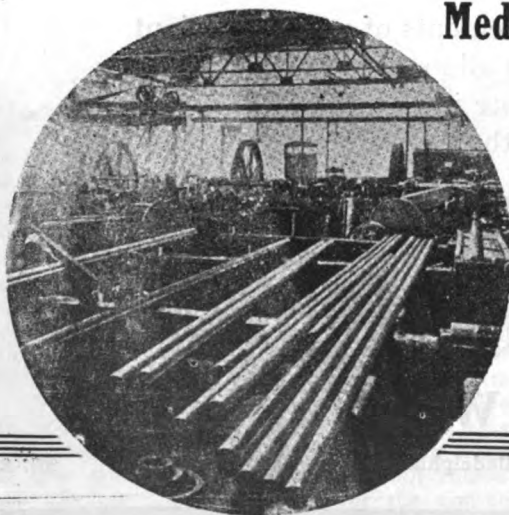
Full pressure on the bar to the extreme end insures perfect work, particularly in straightening crooks at the ends of bars, which many machines cannot perform. Size of Bars, that can be handled range from 1/16" to 6" in diameter.

Write for Medart Catalog.

Medart Patent Pulley Co.

St. Louis, Mo.

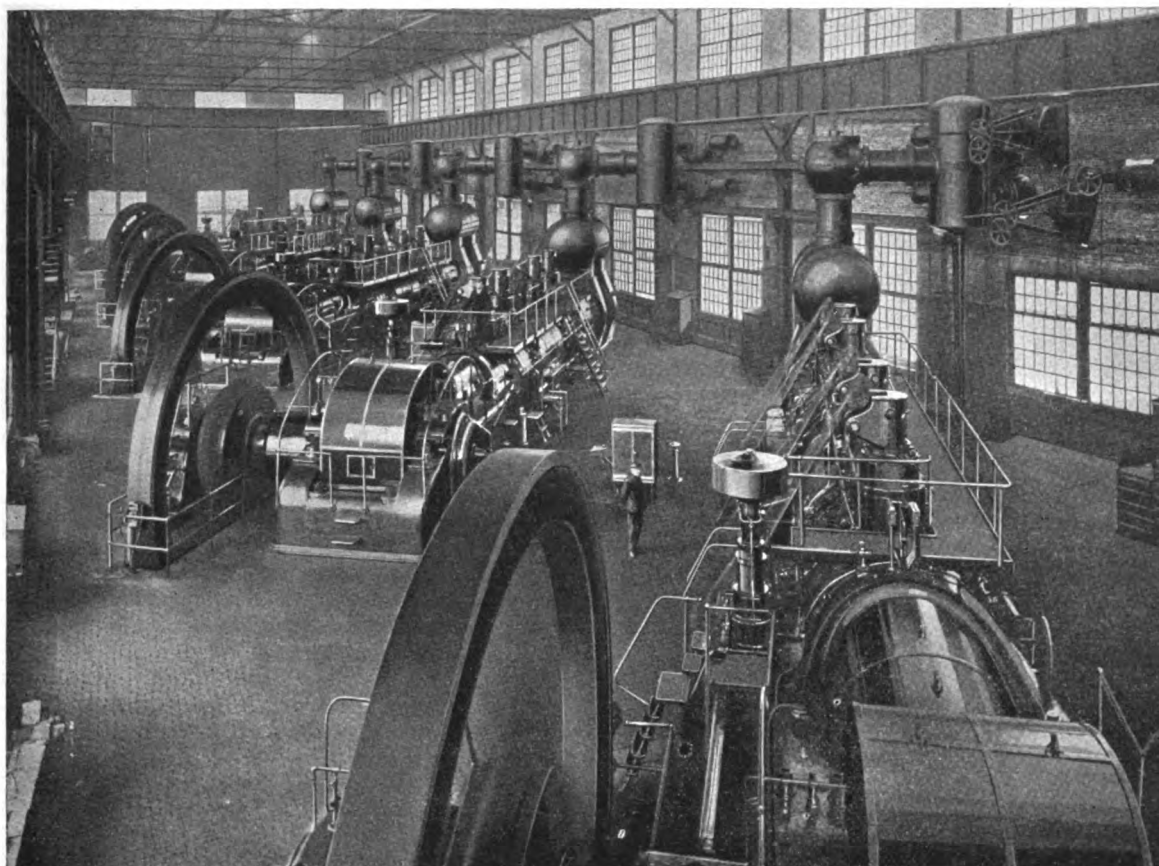
*"To get the Right Start
—Equip with MEDART—"*



Co-operate:—Refer to The Blast Furnace and Steel Plant

MESTA

GAS BLOWING ENGINES



Four Mesta Gas Blowing Engines Operating Two 500-Ton Blast Furnaces. The Fifth Engine Is Held in Reserve.

Utilize Your Blast Furnace Gas to the Best Advantage

Install Gas Blowing and Gas Power Engines and save the cost of "make-up" coal

CONSIDER THESE FACTS

The amount of gas liberated from the average blast furnace under normal operating conditions is about 150,000 cu. ft. per ton of pig iron produced per 24 hours. Of this amount:

- 30% is consumed by hot blast stoves
- 8% is lost by leakage
- 1% is sufficient to operate the Gas Blowing Engines**
- 50% remaining, is more than sufficient to generate all power necessary.

For reliability and ease of operation Mesta Gas Engines are equivalent to any steam driven unit.

Manufactured by

MESTA MACHINE COMPANY
PITTSBURGH PENNSYLVANIA

Co-operate:—Refer to The Blast Furnace and Steel Plant

ASHLAND FIRE BRICK

The Open Hearth Furnace is probably one of the most severe processes, of metallurgical operations on fire brick. Here the operator who is constructing or relining a furnace of this type will do well to use brick of proven durability and capable of the service which it must withstand.

ASHLAND fire brick has been used for years by the most experienced furnace men of the country for this severe practice, and the results have proven highly satisfactory in every installation on record.

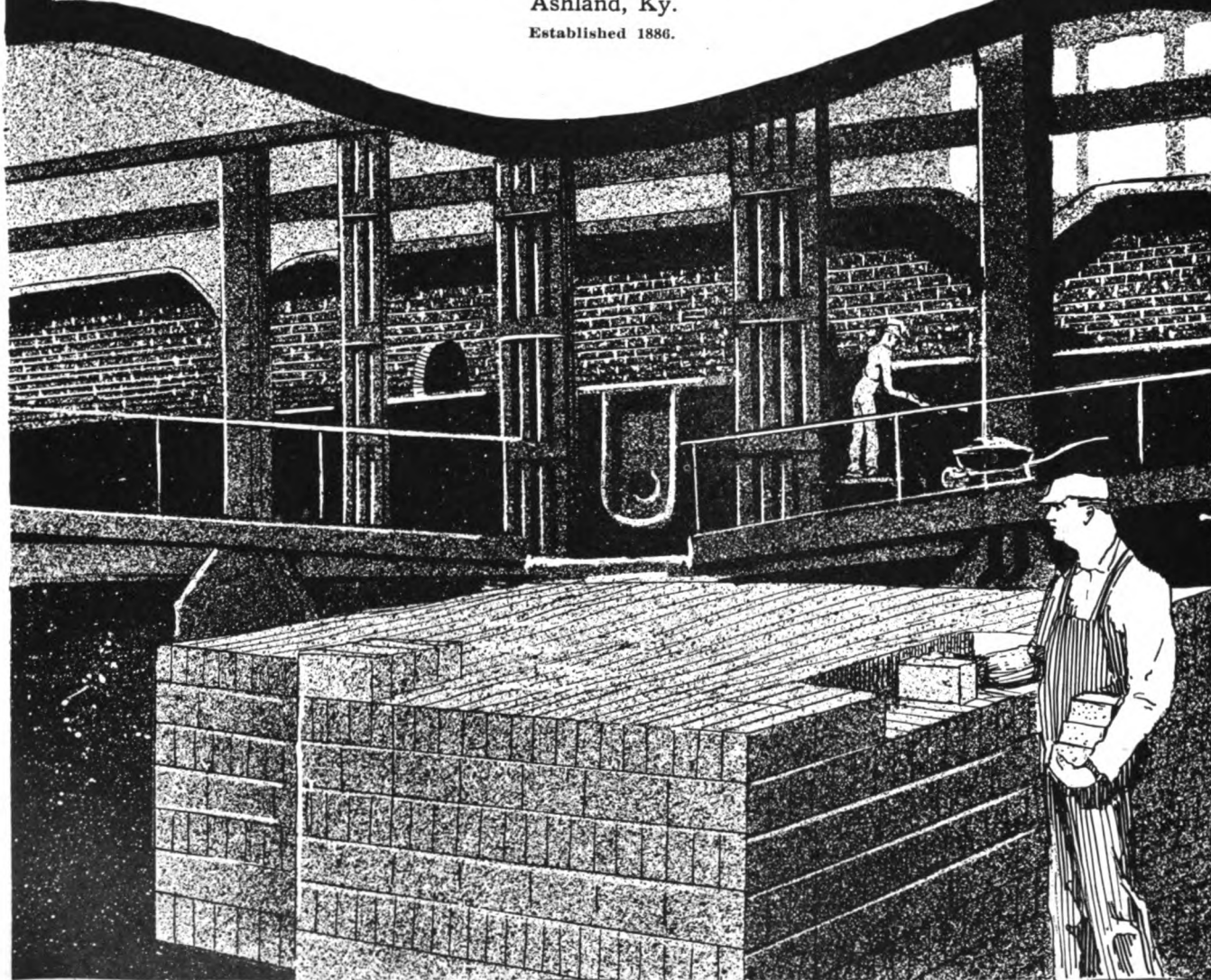
EVERY department of Steel Manufacture has been served by ASHLAND Refractories—Blast Furnace—electric furnaces, converters, welding furnaces, annealing furnaces and any place fire brick is employed; giving greater service and gaining the confidence of engineers and superintendents bent on maximum production.

ASHLAND has solved many of the most difficult furnace problems. You may have one that seems insoluble. The sure way is to consult ASHLAND experts. They know the importance of good fire brick.

The Ashland Fire Brick Co.

Ashland, Ky.

Established 1886.



"Line with the Ashland Line"

Co-operate:—Refer to The Blast Furnace and Steel Plant

KOPPERS COKE OVENS

IN OPERATION OR UNDER CONSTRUCTION
IN THE UNITED STATES OR CANADA
HAVE AN AGGREGATE ANNUAL
CARBONIZING CAPACITY OF MORE THAN

43,000,000 NET TONS OF COAL

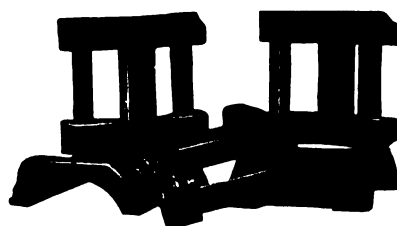
Owner or Operator	Location	Number of Ovens
United States Steel Corporation		
Illinois Steel Company	Joliet, Ill.	280
Illinois Steel Company	Gary, Ind.	700
Tennessee Coal, Iron & R. R. Company	Fairfield, Ala.	434
Minnesota Steel Company	Duluth, Minn.	90
Carnegie Steel Company	Clairton, Pa.	768
American Steel & Wire Company	Cleveland, O.	180
National Tube Company	Lorain, O.	208
Woodward Iron Company	Woodward, Ala.	170
Coal Products Mfg. Company	Joliet, Ill.	35
Algoma Steel Corporation, Ltd.	Sault Ste. Marie, Ont.	110
Inland Steel Company	Indiana Harbor, Ind.	130
Republic Iron & Steel Company	Youngstown, O.	143
Bethlehem Steel Company	Sparrows Point, Md.	360
Bethlehem Steel Company	South Bethlehem, Pa.	424
Bethlehem Steel Company	Steelton, Pa.	60
Laclede Gas Light Company	St. Louis, Mo.	56
Cambria Steel Company	Johnstown, Pa.	92
Toledo Furnace Company	Toledo, O.	94
Youngstown Sheet & Tube Company	Youngstown, O.	306
LaBelle Iron Works	Follansbee, W. Va.	94
United Furnace Company	Canton, O.	47
River Furnace Company	Cleveland, O.	204
Brier Hill Steel Company	Youngstown, O.	84
Gulf States Steel Company	Gadsden, Ala.	37
Seaboard By-Product Coke Company	Jersey City, N. J.	165
Minnesota By-Product Coke Company	St. Paul, Minn.	65
Colorado Fuel & Iron Company	Pueblo, Colo.	120
Indiana Coke & Gas Company	Terre Haute, Ind.	30
Dominion Iron & Steel Company, Ltd.	Sydney, N. S.	180
Providence Gas Company	Providence, R. I.	40
Jones & Laughlin Steel Company	Pittsburgh, Pa.	300
Rainey-Wood Coke Company	Swedeland, Pa.	110
Birmingham Coke & By-Products Company	Birmingham, Ala.	50
Donner Union Coke Corporation	Buffalo, N. Y.	150
Domestic Coke Corporation	Fairmont, W. Va.	60
Pittsburgh Crucible Steel Company	Midland, Pa.	100
Chicago By-Product Coke Company	Chicago, Ill.	100

THE KOPPERS COMPANY

PITTSBURGH, PA.

Builders of By-Product Coke Plants

Co-operate:—Refer to The Blast Furnace and Steel Plant



WHAT is it that causes you the greatest amount of trouble in your Mill Bearings? Think it over and then take it up with us.

There is no trouble that cannot be obviated at least to a great extent.

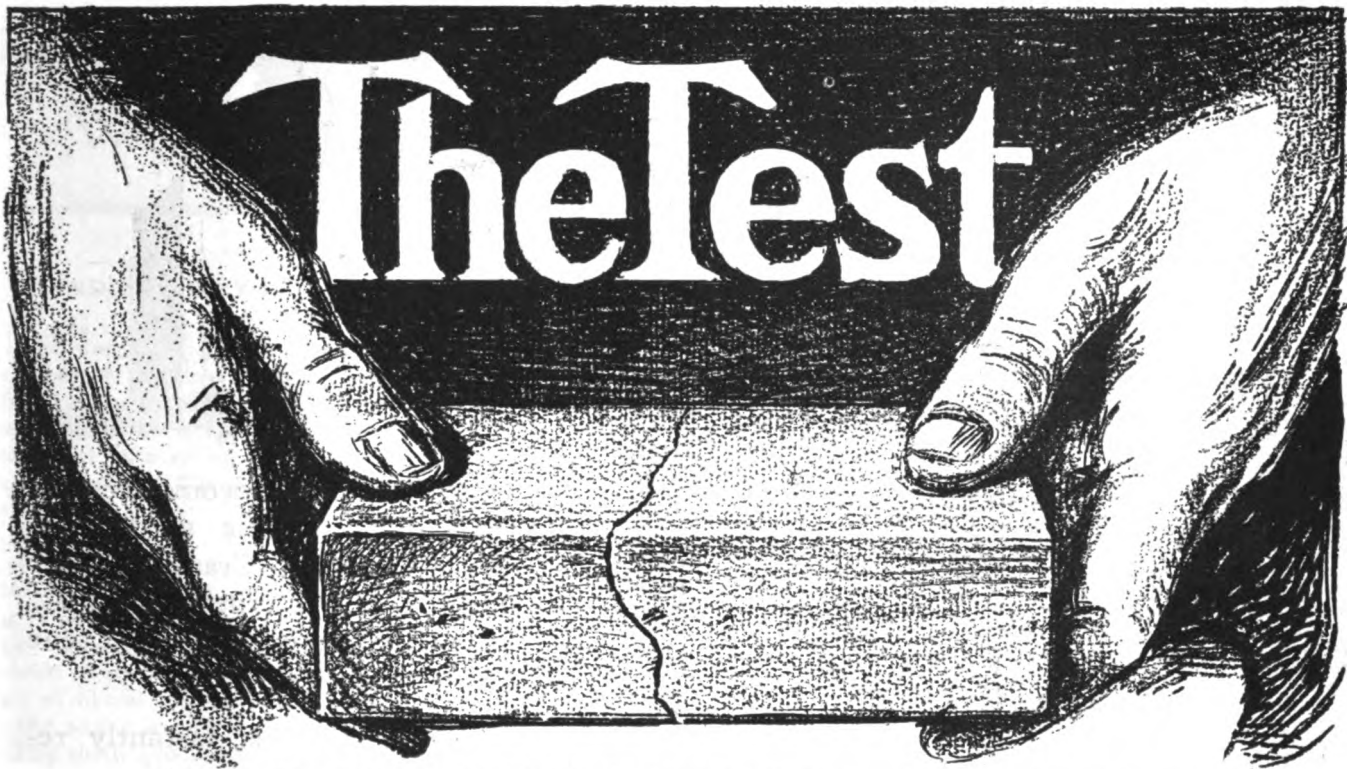
Perhaps you have been using Bearings made largely from scrap. Damascus make insures virgin metal. It may be your working conditions require a special mixture on account of unusual demands. We analyze individual requirements and prepare something fitted to your needs.

In whatever way you may be confronted by difficulties consult us. We will be glad to study the situation and apply our forty years of experience to eliminating the trouble.

Damascus Bearings are Better Bearings. Ask for information and quotations.

DAMASCUS BRONZE CO.
PITTSBURGH

Co-operate:—Refer to The Blast Furnace and Steel Plant.



WELDING FIRE BRICK SAME AS METALS

Break a fire brick in two—Butter it evenly with "ADAMANT"—Place it in a furnace until white hot—Take it out—Let it cool—THEN TRY TO BREAK IT!—the brick can be broken, but NOT the "ADAMANT" joint.

"ADAMANT" is extensively used in fire brick construction of all types, and is positively the only Fire Brick Cement that will withstand the "hard knocks" of abuse and vibration. Superintendents from all over the country tell us "that to build a furnace without "ADAMANT" is like

BUILDING A SHIP WITHOUT A PROPELLER"

"ADAMANT," the original high temperature cement, is scientifically prepared for use in all fire brick construction instead of old-fashioned, quickly deteriorating fire clay.

"ADAMANT" welds the fire brick together, forming an almost indestructible mass and a permanent gas tight structure.

It binds without heat!

It welds at 1500° F.!

It will withstand any variation of temperature up to 3100° F. or more!

"ADAMANT" is an insurance policy on your furnace walls! and will return its cost hundreds of times over in the saving of fire bricks and labor alone, and entirely eliminates the joint.

"ADAMANT," when used as a coating or wash for interior furnace walls, will add considerable life to even the cheapest grade of fire brick.

"ADAMANT" is shipped in special air-tight galvanized containers, and will keep indefinitely without deteriorating or hardening.

Additional information and samples on request.

MANUFACTURED SOLELY BY THE

BOTFIELD SPECIALTIES MFG. CO.,

800 Swanson Street

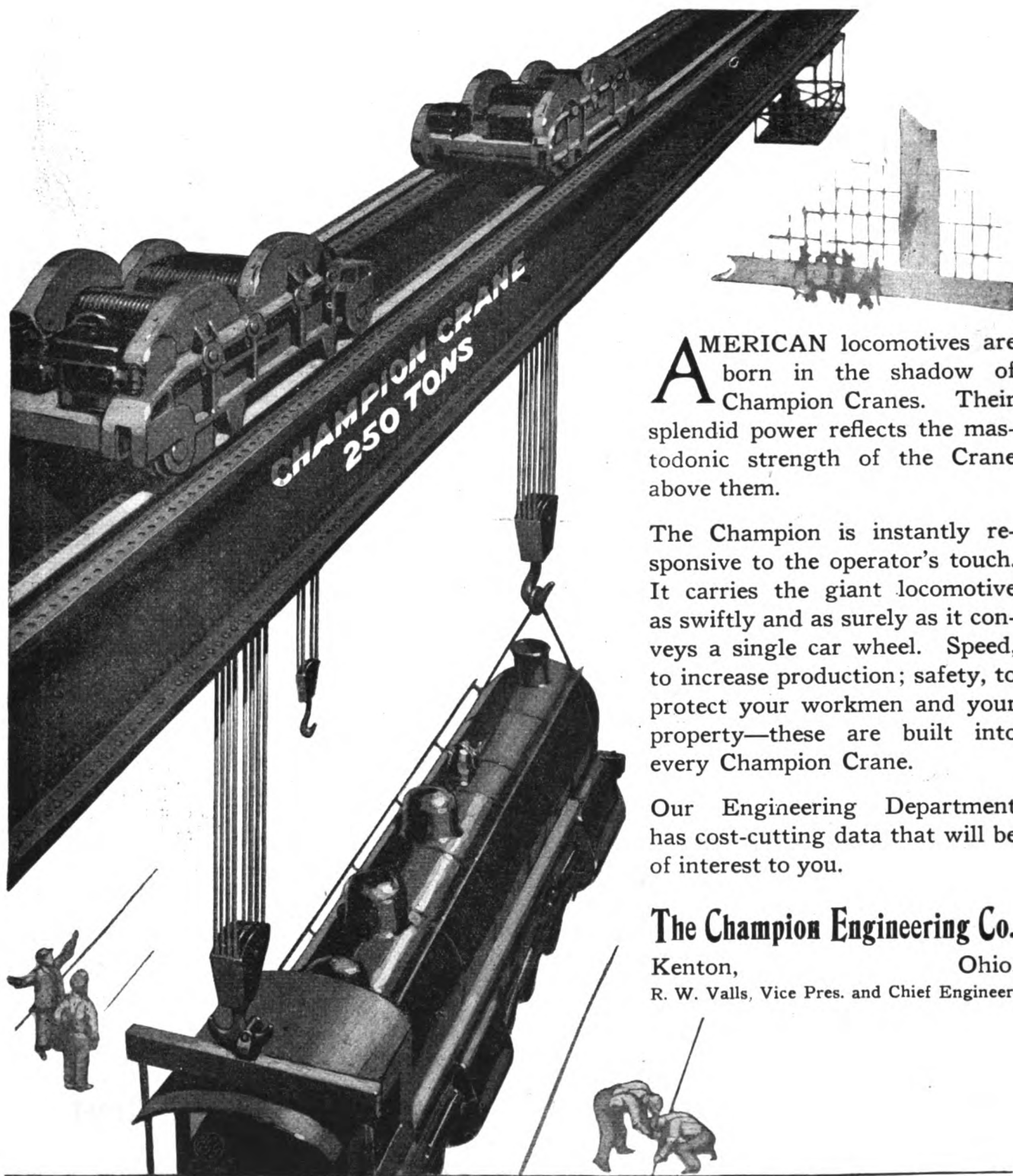
PHILADELPHIA, PA.

WHENEVER YOU USE A FIRE BRICK USE

ADAMANT

FIRE BRICK CEMENT

Co-operate:—Refer to The Blast Furnace and Steel Plant



AMERICAN locomotives are born in the shadow of Champion Cranes. Their splendid power reflects the mastodonic strength of the Crane above them.

The Champion is instantly responsive to the operator's touch. It carries the giant locomotive as swiftly and as surely as it conveys a single car wheel. Speed, to increase production; safety, to protect your workmen and your property—these are built into every Champion Crane.

Our Engineering Department has cost-cutting data that will be of interest to you.

The Champion Engineering Co.
Kenton, Ohio.
R. W. Valls, Vice Pres. and Chief Engineer.

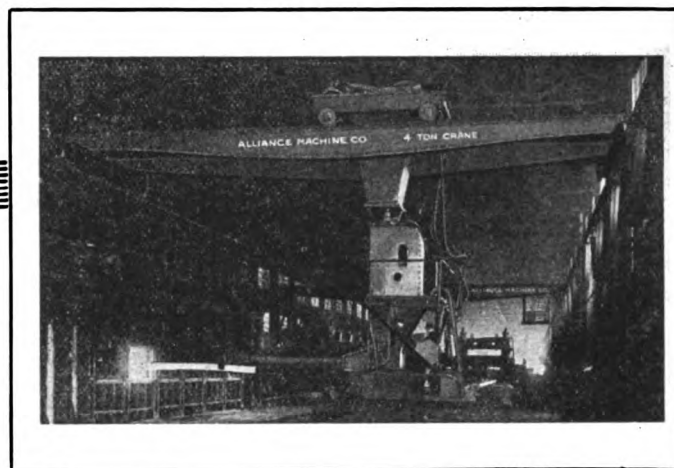
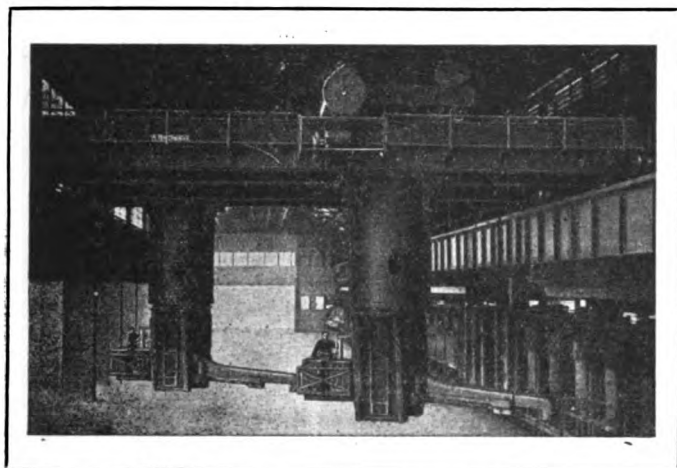
NEW YORK
J. W. Spensley,
149 Broadway
PITTSBURGH
Laughlin-Barney
Machinery Co.
PHILADELPHIA
Williams & Thomas
Machinery Co.
829 Com. Trust Bldg.
PORTLAND, ORE.
Portland Machy. Co.
SEATTLE
Hallidie Machy. Co.

CHAMPION CRANES



SAN FRANCISCO
Louis G. Henes
76 Fremont St.
PARIS, FRANCE
L. & E. Frenkel, Inc.
20 Rue des Capucines
TOLEDO
W. C. Lloyd & Co.,
1113 Second Nat.
Bank Bldg.
LOS ANGELES
Louis G. Henes
Title Insurance
Building

Co-operate:—Refer to The Blast Furnace and Steel Plant



The Cranes For Service

In addition to our line of Standard Cranes for every service from 5 to 200 tons capacity, we build more large and special types than all others combined. There is nothing in crane building too large or difficult for us to make.

ALLIANCE CRANES

are the result of our vast experience in handling the difficult and unusual installations in the steel industry. The design and construction of Alliance Cranes, together with mechanical leadership and high grade workmanship have made us the largest manufacturers of the world's largest cranes.

Write and tell us your problems.

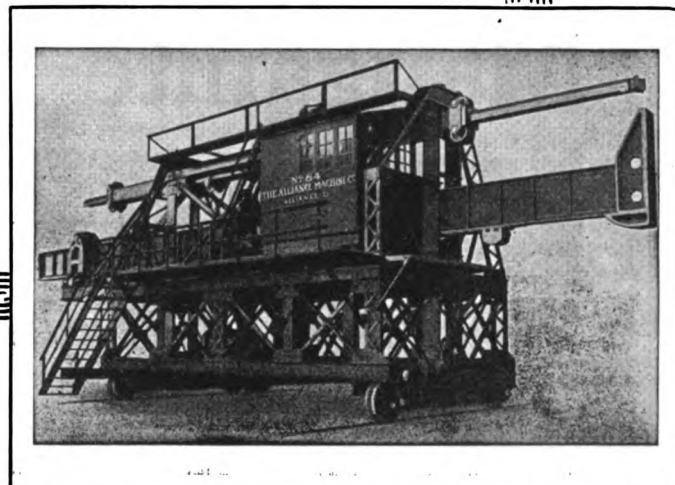
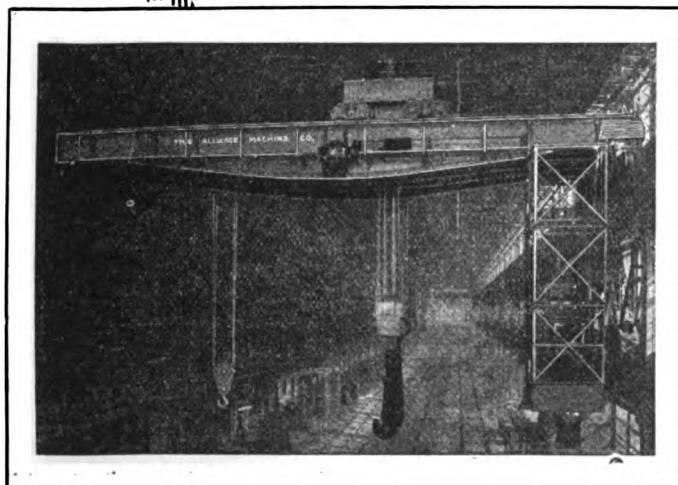
The Alliance Machine Co.

Pittsburgh

Alliance, Ohio.

Birmingham

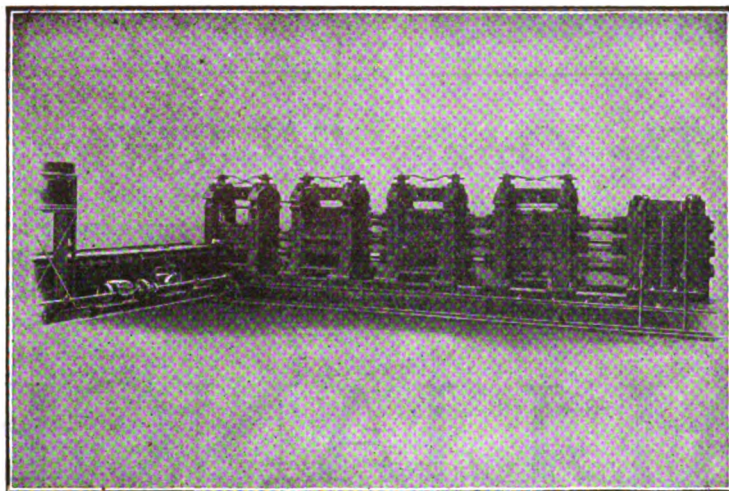
The World's Largest Builders of the World's Largest Cranes.



Co-operate:—Refer to The Blast Furnace and Steel Plant

Mackintosh-Hemphill Co.

Pittsburgh, Pennsylvania



28" Structural Mill.

Complete Equipment for Rail and Structural Mills

Manganite—Rolls—Steel

"The Best in Rolling Mill Machinery"

Co-operate:—Refer to The Blast Furnace and Steel Plant

CHAPTER I COMBUSTION ENGINEERING

*How the new chief met the problems
of fuel economy and plant efficiency*

Jim Payne had been chief engineer of the Great Western Hotel for nearly twelve years. Just now, however, he was sorely peeved; he had asked for an increase in salary and had been turned down. As a consequence he had tendered his resignation. The manager had refused to give the desired raise because he was not quite satisfied with the manner in which the operating costs were piling up. Of course, fuel, oil, materials, supplies and other expenses had gone up nearly every day, but the manager was not satisfied with the statement that some improvement could not be made.

When Payne tendered his resignation the manager asked him to recommend a man for the place. He recommended the young assistant chief, who had been in charge of the detail work and most of the repairs for nearly three years.

"It's up to you now to make good," Payne told the assistant when he informed him of the latest move. "I guess I have let my years get away from me without taking advantage of the opportunities there are for the man who knows Combustion."

That morning the general manager of the hotel called the assistant into his private office for a short talk. "These are serious times," he said, "and every power plant owner, like myself, must look forward to greater saving in fuel. There is a real opportunity here for the man who knows, or the man who will study Combustion."

The new chief readily saw that the new job called for more brain work than physical work and *"it was evident that employers were willing to pay more for a strong mind than for a strong back."*

Presently the new chief wandered back to his desk and extracted a large report or dope sheet. On this he began to write a thousand and one questions about the plant, directed at himself. He was cross-examining himself, much as a shrewd lawyer would examine a witness on the stand.

The questions ran something as follows:

WHAT are your chances for real success?

Do you realize the opportunities that a knowledge of Combustion offers to the man who wants to be more than merely the average?

It is not so much a strong back today as it is a strong mind that counts!

The man who knows Combustion can state his own salary and his services are always in demand.

Would you like to have the opportunity of getting a thorough knowledge of Combustion and Boiler Room Management in your spare time and at a very small cost, payable monthly if so desired? Jos. W. Hays, author of the Course and Educational Director, formerly Consulting Combustion Engineer of the U. S. Navy; W. L. Abbott, Chief Operating Engineer of the Commonwealth Edison Company; Fred R. Low, Editor of "Power"; Prof. S. W. Parr, Department of Chemistry, University of Illinois; Joseph Harrington, formerly Administrative Engineer, U. S. Fuel Administration; David Moffat Myers, formerly Advisory Engineer for the U. S. Fuel Administration; Arthur L. Rice, Editor of

This Free Book

will tell you some interesting pointers that the average power plant and boiler room man should know, particularly about Combustion Engineering

"Power Plant Engineering," and I. E. Moulthrop, Bureau of Construction, Edison Electric Illuminating Co., have now made it possible for you, thru the Hays Course in Combustion Engineering and Boiler Room Management, to obtain a thorough knowledge of Combustion in your spare time without interfering with your present work in the least.

The coupon will bring to you, without any expense whatever, a copy of this interesting book, covering power plant and boiler room management. It tells you how other men like yourself have, thru the Hays Course, achieved real success and how the same can be made possible in your case.

If you are determined to get out of the ordinary class and to push ahead where your services will be worth much more than they are today, get your copy of this book at once. It will help you from the time you receive it. It will interest and inspire you because it shows a better way toward bigger things. It also shows how, thru the Course, in addition to obtaining a knowledge of Combustion, you get, as well, a liberal education, paving the way for real executive ability.

Your request for this book will obligate you in no way whatever — merely clip the coupon below and return it today with your name plainly written or typed.

Promptly upon receipt of the coupon the book will be sent you — absolutely FREE.

Send for Free Book — "Opportunities for the Combustion Expert."

Name

Address

City..... State.....

Position

With.....

(Name of Company)

Hays School of Combustion
Dept. 70A, 1412-14 S. Michigan Ave., Chicago, Ill.

Co-operate:—Refer to The Blast Furnace and Steel Plant

How Much Do You *Really* Know About Bearing Metals?

A Few weeks ago we were discussing the subject of bearing metals with the Chief Engineer of a well known Corporation. In the course of the conversation we asked him the above question, and received the answer that would be given by nine hundred and ninety-nine of every thousand engineers.

We told him the following story, gave him a copy of "The Restoration of a Lost Art," and went our way.

Here is the story:

At a meeting of the Committee appointed to prepare the new Dictionary of the French language, one of the members was asked to define the word "Lobster". He replied "The lobster is a fish, red in color."

The Chairman immediately retorted: "My learned friend is right except in two unimportant details. A lobster is not red, neither is it a fish."

The next morning the Chief Engineer called us up and said: "I have read your book and guess I was the Frenchman. Send me a thousand pounds of your metal."

How much do you really know about Bearing Metals?

The coupon brings your copy of "The Restoration of a Lost Art."

(Clip this Coupon NOW)



PROMET

THE HEAT-TREATED BEARING METAL

To The American Crucible Products Co., Elyria, O.

Please send me without charge, the Promet Book, "The Restoration of a Lost Art."

Also send me information regarding the use of PROMET in _____

State Kind of Machinery

Name _____

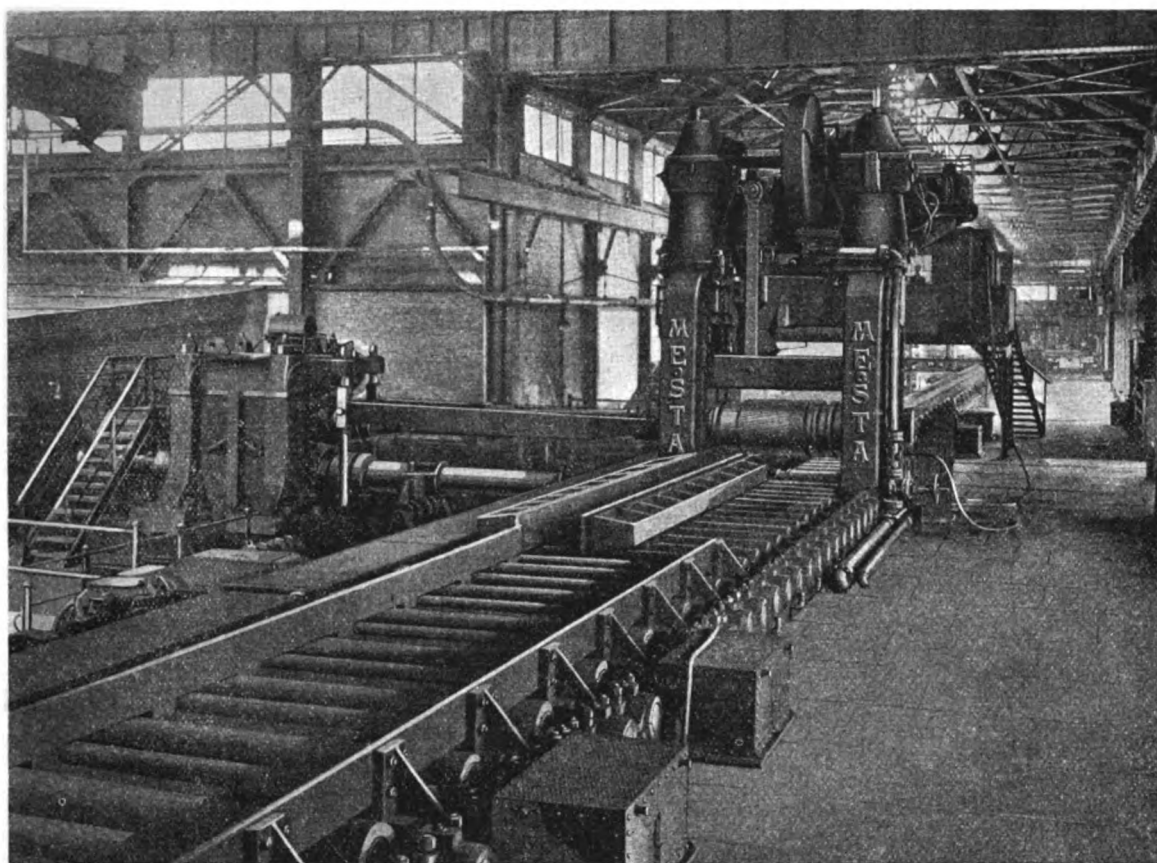
Position _____

Company Name _____

Address _____

Co-operate:—Refer to The Blast Furnace and Steel Plant

MESTA BLOOMING-MILLS



40" Mesta Blooming Mill Installation

Designed and Built for Maximum Production

A DELAY in the operation of the Blooming Mill not only means a decrease in production and increase in cost of material being rolled; but very often causes delays and added expense in other departments that are dependent upon the Blooming Mill for material.

Mesta Patented Universal Spindles and Couplings, with Spindle Shifting Device which permit quick roll change; quick acting Screw Down; Forged Steel Spindles and many other distinctive features with respect to design and material used, insure continuous operation to the greatest possible extent and practically eliminate the possibility of any serious delay.

MESTA MACHINE COMPANY
PITTSBURGH PENNSYLVANIA

Co-operate:—Refer to The Blast Furnace and Steel Plant

1886

1920

ASHLAND FIRE BRICK

Has long been serving the steel industry in its varied operations.

Metallurgists who made their first Ashland installation are still using Ashland Fire Brick. Superintendents who have tried Ashland with other brick invariably specify them.

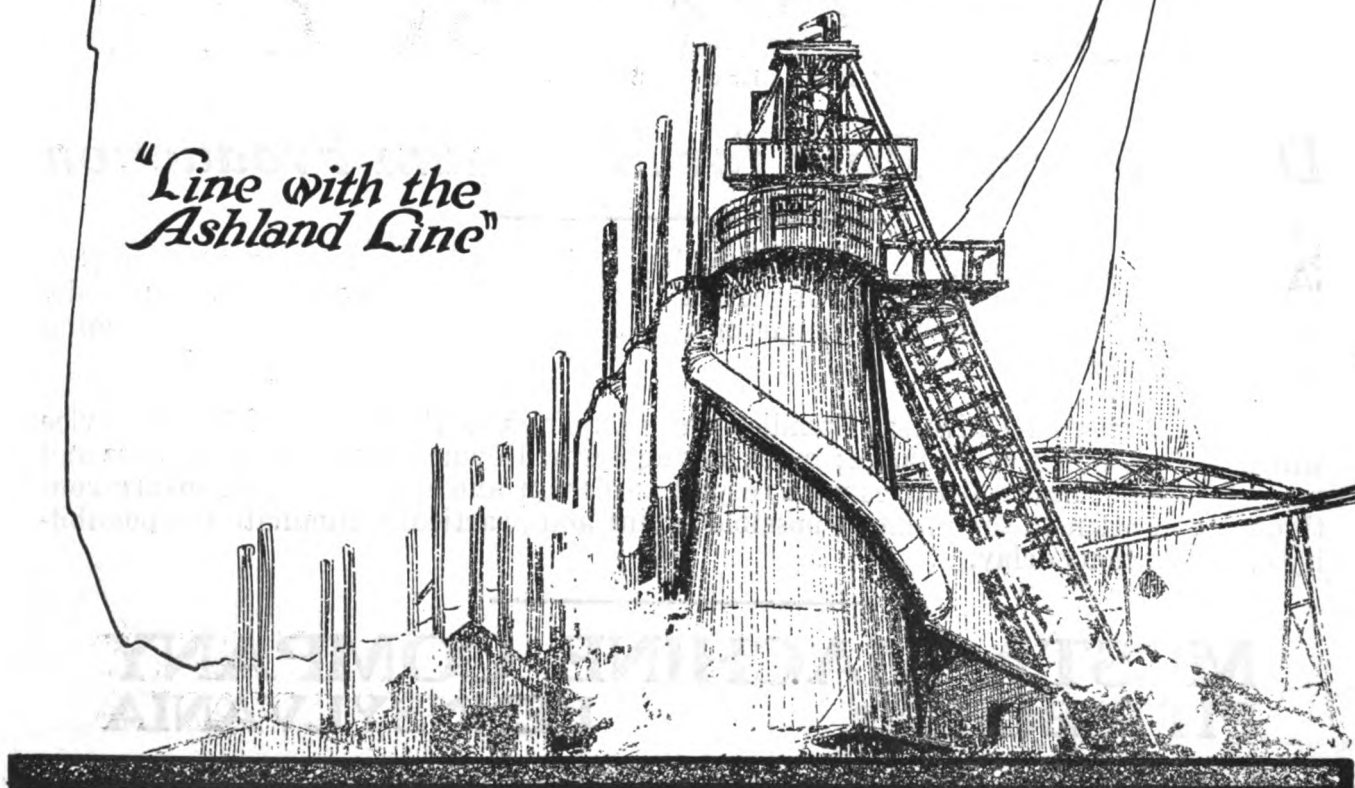
—WHY—

Ashland Fire Brick is uniform, is pure and has great durability. Many replacements which were constantly occurring in furnaces lined with poor fire brick have been eliminated with the employment of Ashland Fire Brick. This has been accomplished through the efforts of an organization thoroughly familiar with the fire brick "game." Ashland Fire Brick means more than good fire brick. It extends to the installation and the actual results in practice. It is the Ashland purpose to supply you, not with fire brick, but with the means of long continuous uninterrupted production.

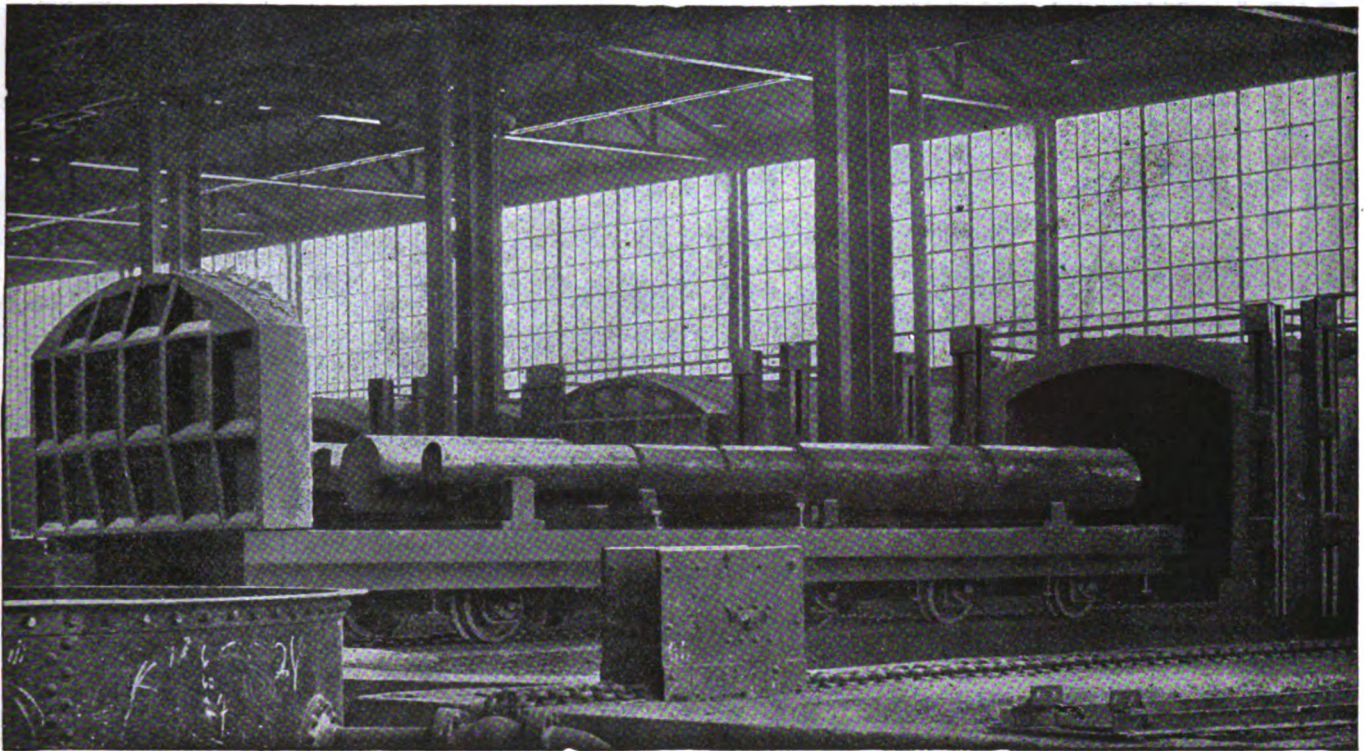
Many large plants now co-operating with the Ashland Organization are getting longer life and greater tonnage from their linings.

Ashland Fire Brick Co.
ASHLAND, KY. *Incorporated 1886*

*"Line with the
Ashland Line"*



Co-operate:—Refer to The Blast Furnace and Steel Plant



EASTON CARS Made for *Your* Work

OUR business is to make you *the* car you want, and not necessarily to sell you *a* car we've made. Of course, we have stock models of industrial cars for various industries, but at that, they represent the consensus of car needs in these industries, rather than an arbitrary design. The skill of our engineers is backed by a manufacturing experience of more than a quarter of a century.



Whatever your plant needs to carry on wheels, we can plan the routing, make and lay the track and build the cars that will do the work most economically and efficiently. That is what we mean by Easton Industrial Service.

Tell us your needs and wishes and we will be pleased to make recommendations.

EASTON CAR & CONST'N CO.



44 Church St., New York

Works: Easton, Pa.

Boston

Chicago

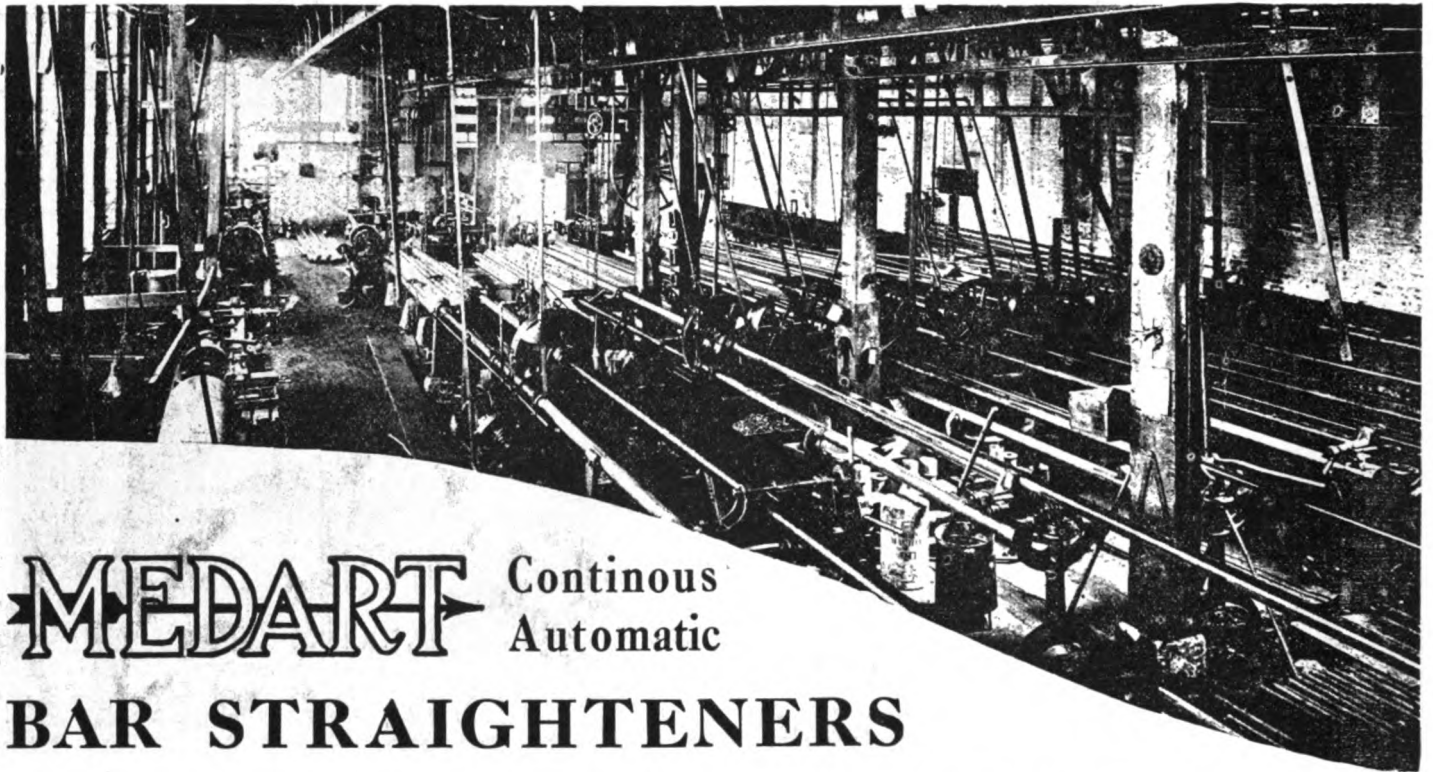
Detroit

Philadelphia

Pittsburgh

2039-E

Co-operate:—Refer to The Blast Furnace and Steel Plant



MEDART Continuous Automatic **BAR STRAIGHTENERS**

Are shown in the above plant where many tons of bars are straightened daily. Here as in many other plants the Medart is employed in straightening bar products for many uses.

Any length bar can be handled on this machine and from 40 to 80 feet per minute can be straightened, polished and cold rolled in the one operation.

Size of bars handled range from 1/16" to 6" in diameter. One man and a helper can operate six machines properly and the cost of turning is reduced to a low figure.

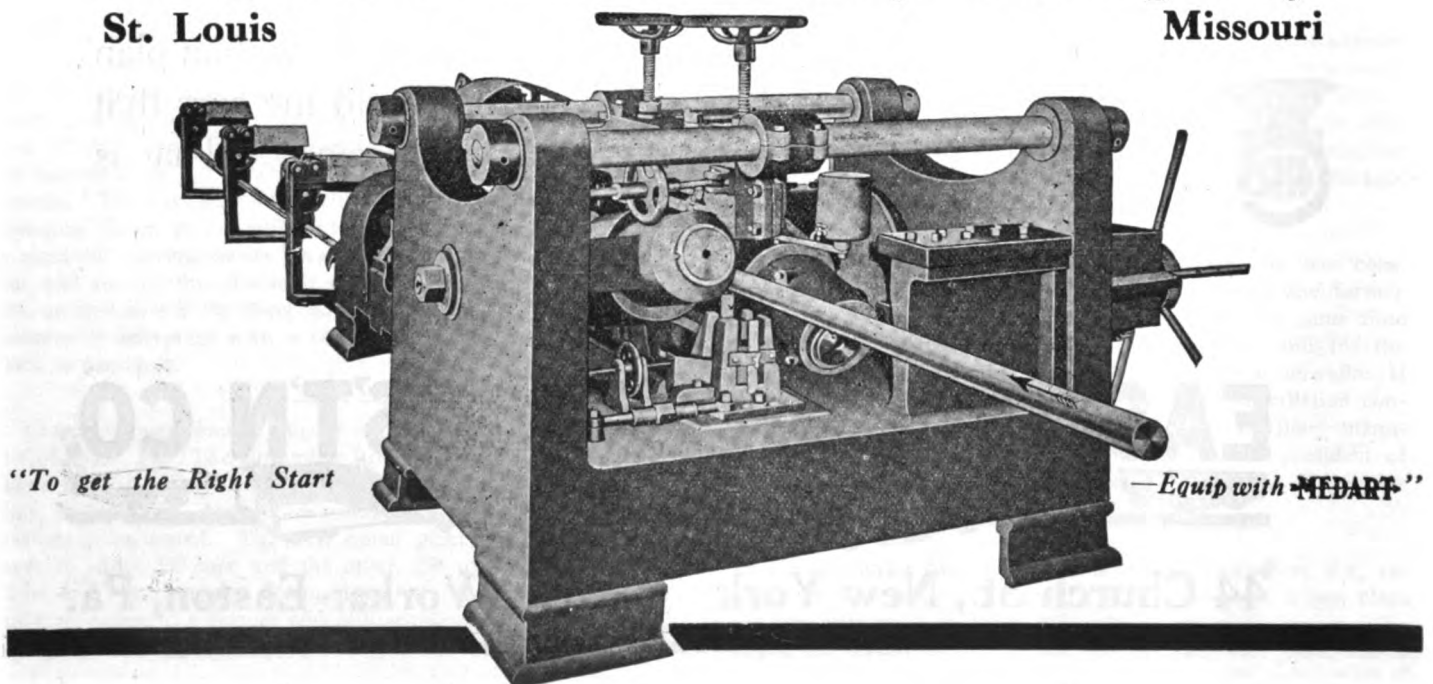
In these days when help is scarce, particularly mechanics, this feature is of first importance.

The Medart Straightener is automatic in operation with worm gear drive giving positive operation. All grades of metal can be handled with equal success, from soft brass to alloy steel.

Write for Medart Literature.

Medart Patent Pulley Company

St. Louis **Missouri**



Co-operate:—Refer to The Blast Furnace and Steel Plant

THE KOPPERS CO.

Designers and Builders
of

By-Product Coke Plants, Benzol
Recovery Plants, Motor Fuel Re-
covery Plants, Ammonia Recovery
Apparatus, Tar Distilling Plants,
By-Product Gas Producers, Gasoline
Absorption Plants.

CONSULTING ENGINEERS

on the operation of
By-Product Coke and Gas Plant
and their Auxiliaries

Properties Examined
Engineering Reports and Financial Statements Prepared
Coals Analyzed and Tested

THE KOPPERS COMPANY
PITTSBURGH, PA.

Co-operate:—Refer to The Blast Furnace and Steel Plant



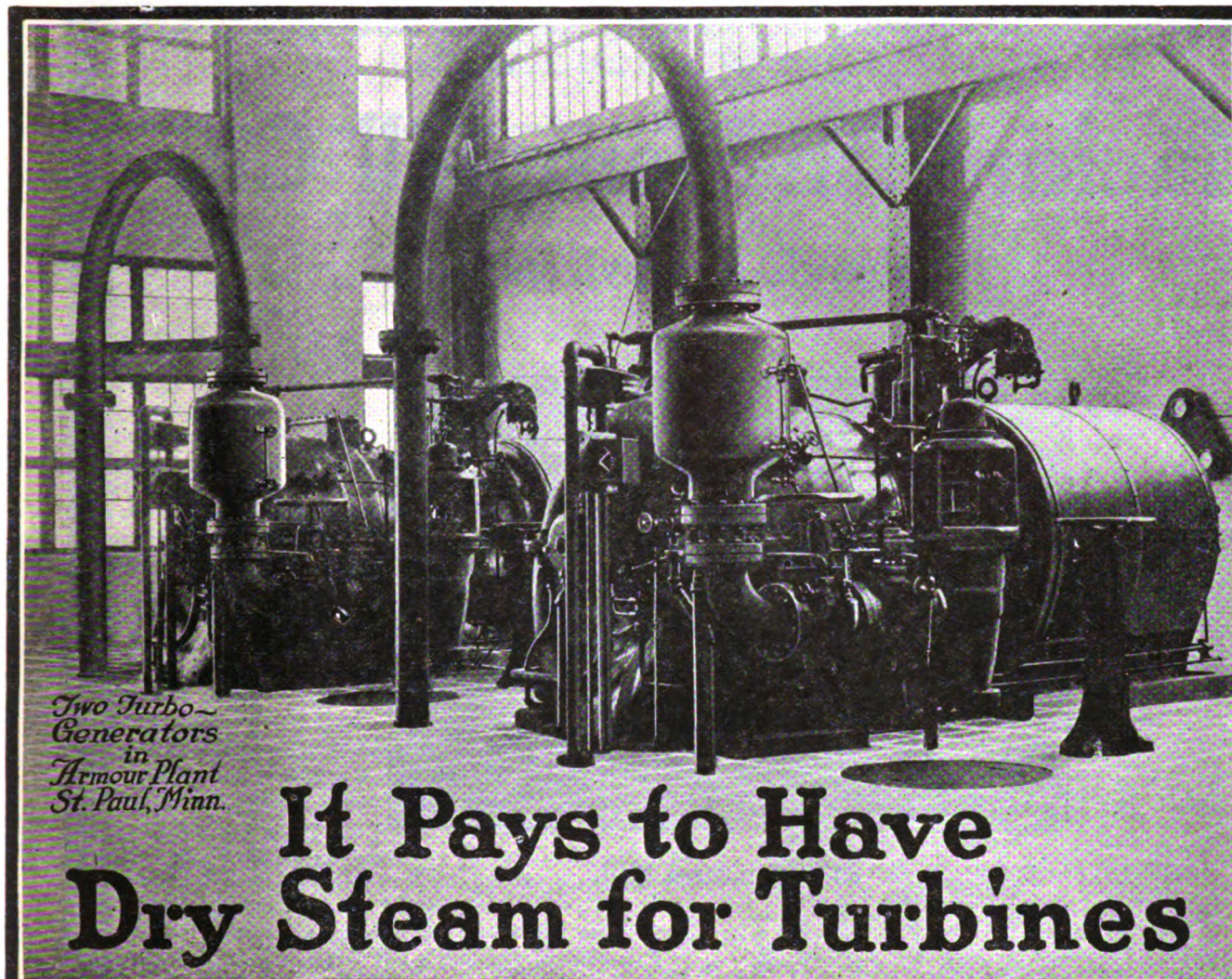
ARE you taking advantage of our forty years of experience in applying our knowledge of Mill Bearings to working conditions? It is not our desire merely to offer our product for the purpose of securing orders. We want your business, it is true, but we want you to be satisfied with your purchases. Damascus Bearings are Better Bearings, scientifically and accurately made. But there may be one kind that is best for your requirements. We, therefore, invite your inquiries so that we may intelligently co-operate with you to bring about the highest degree of bearing service.

*Write to us for any information you
need along this line.*

DAMASCUSBRONZE CO.
PITTSBURGH



Co-operate:—Refer to The Blast Furnace and Steel Plant



Two Turbo-Generators
in
Armour Plant
St. Paul, Minn.

It Pays to Have Dry Steam for Turbines

A LOT of harm can be done by little moisture in the steam supplied to a steam turbine. A single slug of water may wreck a steam turbine altogether.

Moisture in the steam supplied to a turbine reduces the efficiency, each pound of water causing an extra pound of steam to be consumed to produce the same amount of work.

Particles of water moving at high velocity cut away nozzles, blades and vanes like a sand blast.

Cochrane Steam Separators insure dry steam for turbines, no matter how much the boilers may prime and foam or how much condensation there may be in the steam line.

If there is a possibility that very large amounts of water may be brought over from the boilers or from pockets to the steam line, Cochrane Receiver Separators, having extra large wells for the reception of water, should be installed.

Cochrane Separators, properly selected and used, are guaranteed to give satisfaction. The guarantee for Cochrane Separators in live steam service, when installed with regard to the conditions and properly drained, is as follows:

"That they will, in either the horizontal or vertical form, deliver steam containing less than $\frac{1}{2}$ of 1% (.005) of entrained water, without regard to the quantity of water in the steam entering them, with water removal capacity dependent only upon the drainage from the wells of the water they take out of the steam."

Separator engineering is a specialty which we have cultivated for nearly thirty years, in which time we have solved nearly every conceivable separator problem. We will be glad to give you the benefit of this accumulated information if you will state your conditions, illustrating if possible, by sketch.

Ask for our book on "Cochrane Separators and How to Use Them."

H. S. B. W. - COCHRANE CORPORATION

SUCCESSORS TO HARRISON SAFETY BOILER WORKS

3108 North 67th Street, Philadelphia, Pa.

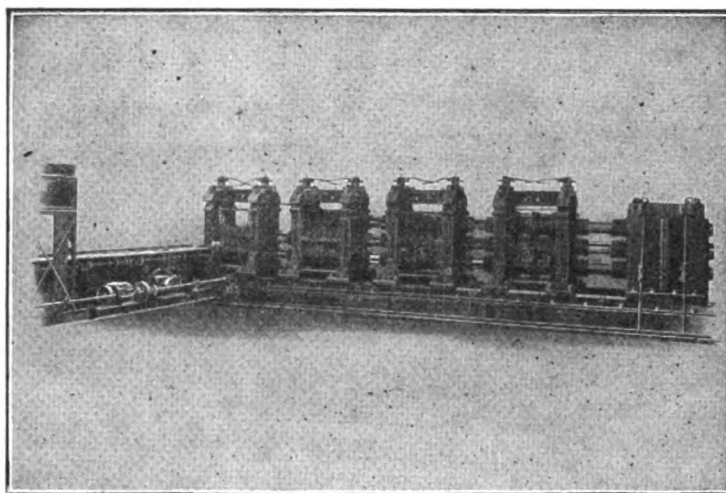
Manufacturers of the Celebrated Cochrane Lines, including Open Feed Water Heaters, Steam-Stack and Cut-Out Valve Heaters and Receivers, Metering Heaters, Independent V-Notch Meters, Flow Meters, Precision Meters, Weighing Meters, Sarge-Cochrane Hot Process Water Softeners, Cold Process Water Softeners, Steam and Oil Separators, Multiport Drainers and Multiport Back Pressure Atmospheric Relief, Flow and Check Valves.

61

Co-operate:—Refer to The Blast Furnace and Steel Plant

Mackintosh-Hemphill Co.

Pittsburgh, Pennsylvania



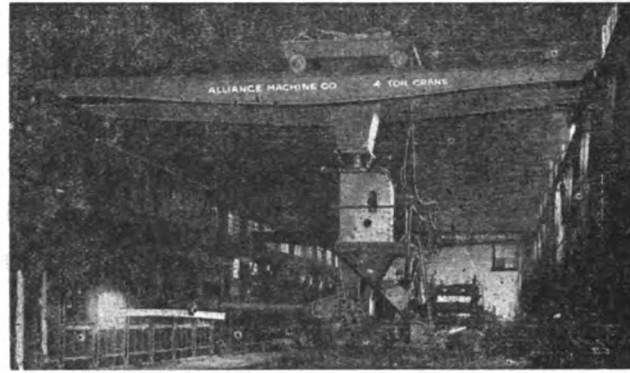
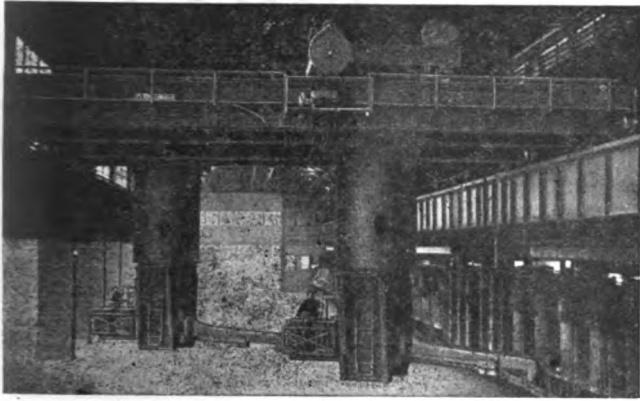
28" Structural Mill.

Complete Equipment for Rail and Structural Mills

Manganite—Rolls—Steel

“The Best in Rolling Mill Machinery”

Co-operate:—Refer to The Blast Furnace and Steel Plant



The Cranes For Service

In addition to our line of Standard Cranes for every service from 5 to 200 tons capacity, we build more large and special types than all others combined. There is nothing in crane building too large or difficult for us to make.

ALLIANCE CRANES

are the result of our vast experience in handling the difficult and unusual installations in the steel industry. The design and construction of Alliance Cranes, together with mechanical leadership and high grade workmanship have made us the largest manufacturers of the world's largest cranes.

Write and tell us your problems.

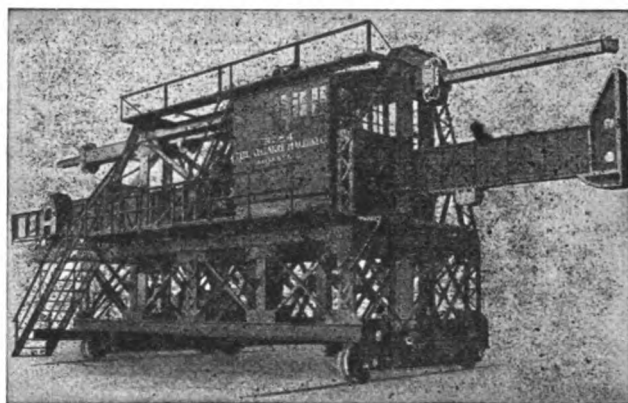
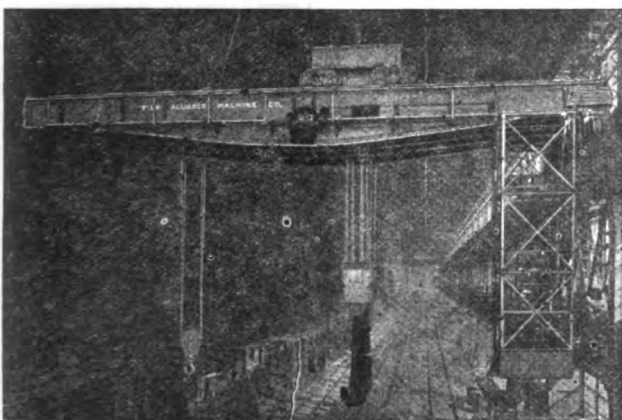
The Alliance Machine Co.

Pittsburgh

Alliance, Ohio.

Birmingham

The World's Largest Builders of the World's Largest Cranes.



Co-operate:—Refer to The Blast Furnace and Steel Plant

REVOLUTIONARY PROMET!

A few typical examples of the results that are being obtained with PROMET, The Heat-Treated Bearing Metal: In the HOT METAL CARS of one of the largest Steel Companies no babbitt lasted longer than three weeks. The PROMET bearings were poured in January and at this date show no signs of wear. In the CONNECTING ROD BEARINGS of a new type of high speed engine no babbitt would stand up for more than twenty-four hours. PROMET shows no wear after two months service.

In the COAL CRUSHERS operated by a well known By-Product Company no babbitt would last more than thirty days. PROMET has been in service for eighteen months and is still going strong.

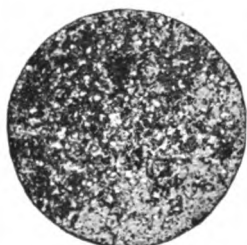
In the 20,000 KW TURBO-GENERATORS of a big Power Company the babbitt bearings had to be replaced every three months. PROMET has been in use for eighteen months and looks good for five years more.

In more than seventy Steel Plants PROMET has broken every previous record for bearing service in ROLLING MILL bearings.

We could fill the pages of this journal with other instances, but these are typical.

How much do you really know about bearing metals?

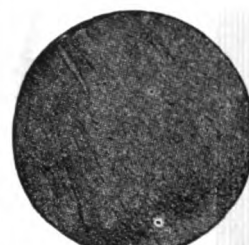
Clip This Coupon



PROMET
Before Heat-Treatment

Full size, unretouched
photographs from
negatives by

Jas. H. Herron & Co.
Consulting Engineers
Cleveland, O.



PROMET
After Heat-Treatment

Carries a load of 9700
pounds per square inch,
without distortion. Has
a coefficient of friction
less than one-tenth that
of genuine babbitt.
Wipes at 590° F. Melts
at 600° F. Cannot cut or
stick to the shaft.



PROMET

THE HEAT-TREATED BEARING METAL

To The American Crucible Products Co.,

Please send me without charge, the Promet Book, "The Restoration of a Lost Art," guarantee coupon and information regarding the use of PROMET in

State Kind of Machinery

Name _____

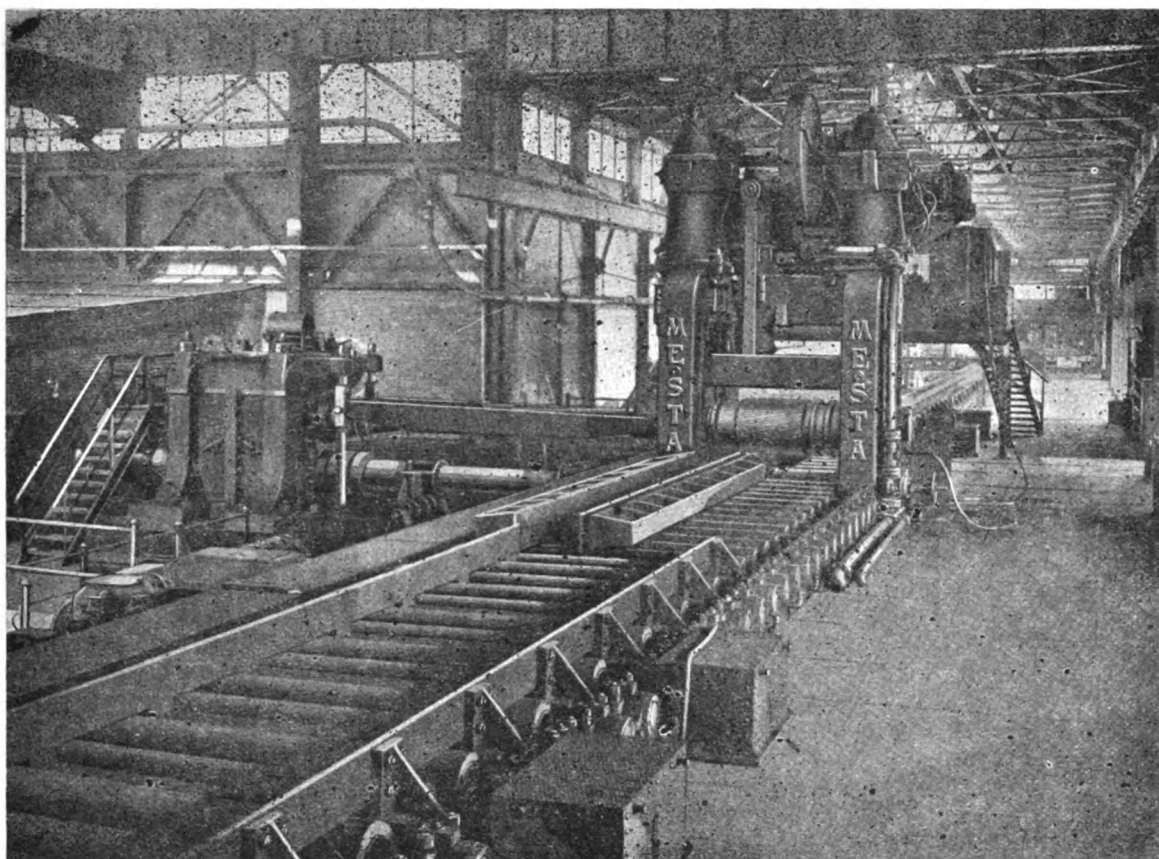
Position _____

Company Name _____

Address _____

Co-operate:—Refer to The Blast Furnace and Steel Plant

MESTA BLOOMING-MILLS



40" Mesta Blooming Mill Installation

Designed and Built for Maximum Production

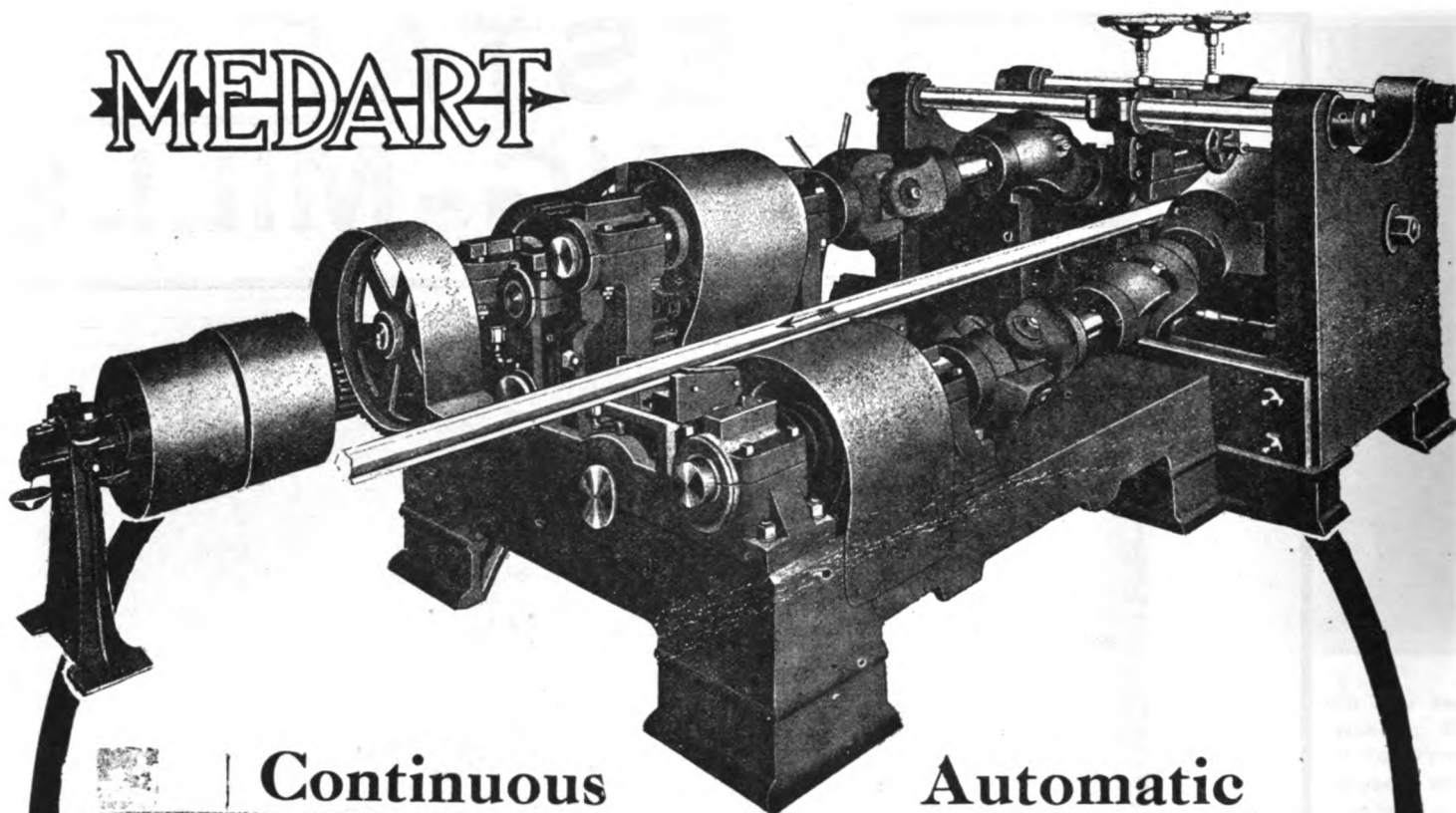
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Mesta Patented Universal Spindles and Couplings, with Spindle Shifting Device which permit quick roll change; quick acting Screw Down; Forged Steel Spindles and many other distinctive features with respect to design and material used, insure continuous operation to the greatest possible extent and practically eliminate the possibility of any serious delay.

MESTA MACHINE COMPANY
PITTSBURGH **PENNSYLVANIA**

Co-operate:—Refer to The Blast Furnace and Steel Plant

MEDART



Continuous Automatic BAR STRAIGHTENERS

Were originally designed for our own bar finishing and shafting plants. Numerous improvements in design soon led to the manufacture of these Straighteners for the trade. From the time the original order was installed, Medart Straighteners have rapidly merged into American Industry and abroad. That satisfaction was attained in their performance is evidenced by the large number of repeat installations from many of the largest steel plants in the world.

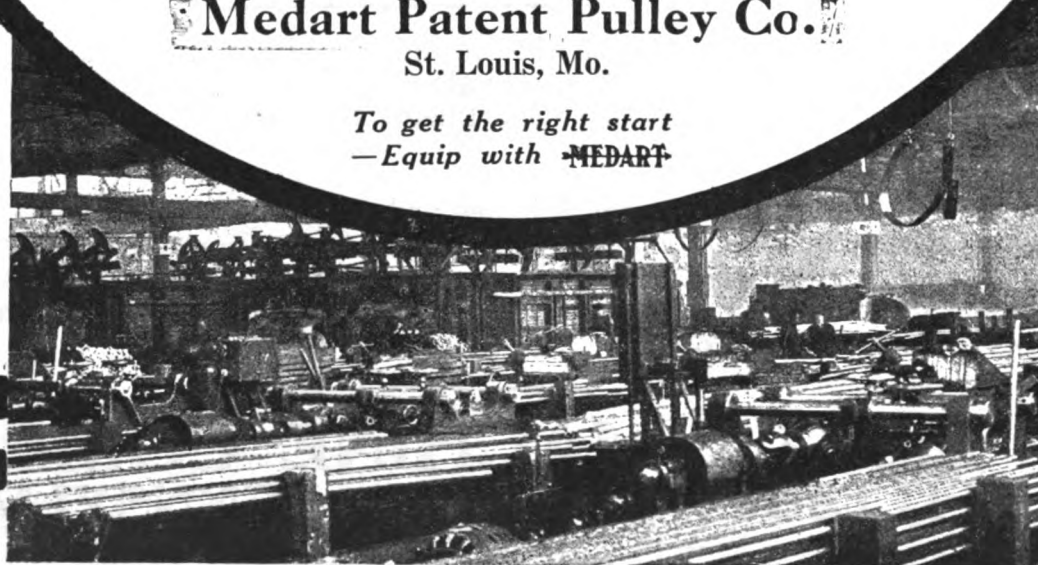
These machines are being used successfully on all grades of metal bars from soft brass to alloy steel, and they have established a standard for turning bars truer to gauge than any other process.

Skilled labor is not required, one man and helper can properly tend to operating six machines, reducing the cost of turning bars to a very low minimum. Any diameter bar can be handled from 6" diameter down.

For full information send for literature.

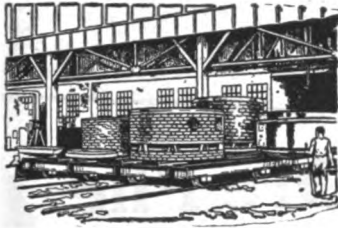
Medart Patent Pulley Co.
St. Louis, Mo.

*To get the right start
—Equip with MEDART—*



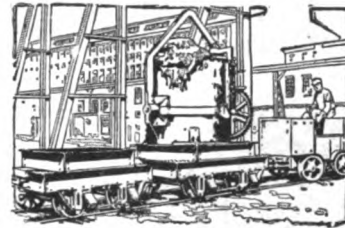
Co-operate:—Refer to The Blast Furnace and Steel Plant

EASTON INDUSTRIAL RAILWAY: CARS



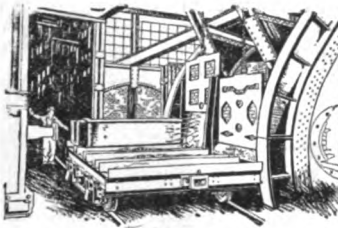
CORE OVEN CARS

Four or Six-wheel Core Oven Cars of standard or special design. Also billet cars and cars for every steel mill, foundry, and industrial purpose.



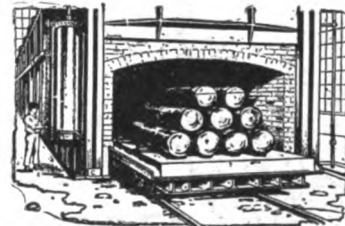
PLATFORM CARS

With or without stake pockets and stakes, brakes, spring draft rigging, removable sides and ends, or automatic couplers. Also specials with raised decks, underslung transfer cars or double truck platform cars to meet any requirements.



CHARGING BOX CARS

We build cars for every steel plant and rolling mill service in both the four-wheel and double-truck, or eight wheel types of standard and special designs. Platforms of heavy steel rails when desired.



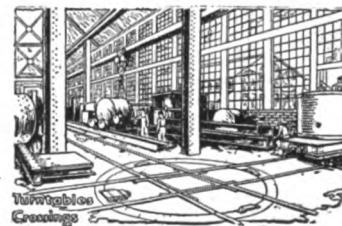
ANNEALING FURNACE CARS

to fit all furnaces. We build them to practically any length, the largest to date being 40 ft. long and equipped with 7 pairs of wheels.



TRACK

Track, switches, turnouts, crossings, cross-overs, turntables, wheels and axles, axle boxes, and roller bearings for inside or outside journals and everything necessary for Industrial Railways.



TURNTABLES

Turntables of standard or special design, correctly balanced, easily operated and of rugged construction throughout are the result of thirty years experience in the design, manufacture and use of this type of equipment.

EASTON ENGINEERING SERVICE

Take advantage of Easton service—which advises freely, and can deliver promptly every detail of an industrial railway, from specially designed single cars to miles of track and complete trains. Easton service puts thirty years' experience in industrial railways problems at your disposal. Ask for recommendations for your plant.

EASTON CAR & CONST'N CO.



General Offices: 44 CHURCH STREET, NEW YORK

Works: EASTON, PA.

Boston

Chicago

Detroit

Philadelphia

Pittsburgh

2073-E

Co-operate:—Refer to The Blast Furnace and Steel Plant

From Ore Pile to Ladle Car

Many and varied are the handling operations in the smelting and purifying of iron and steel for the final casting. These numerous manipulations such as blast furnace smelting, open hearth practice, mixing the different heats for proper analysis, converting and distributing the metal, require tons of refractory materials for the different retorts utilized. These and other important operations are among the service of

ASHLAND FIRE BRICK

Pick up any Ashland Fire Brick, look at it and think of it not as an oblong piece of burned fire clay but as a unit in the production of the steel for locomotives, machinery, buildings and other steel products. The surface shows only a quantity of clay substance hardened in a kiln. But the service of this brick placed in multiples and used to combat the attacks of sloshing white metal represents experience, lots of it, manufacturing equipment, capable of any fire brick requirement, and raw materials, the finest Kentucky Clays obtainable—then you see Ashland Fire Brick in its character.

Character built from an organization of experience and resources means more than fire brick—it means service—a reinforcement to your present production forces.

Try Ashland Fire Brick on your next lining—we can supply you promptly.

ASHLAND FIRE BRICK CO.

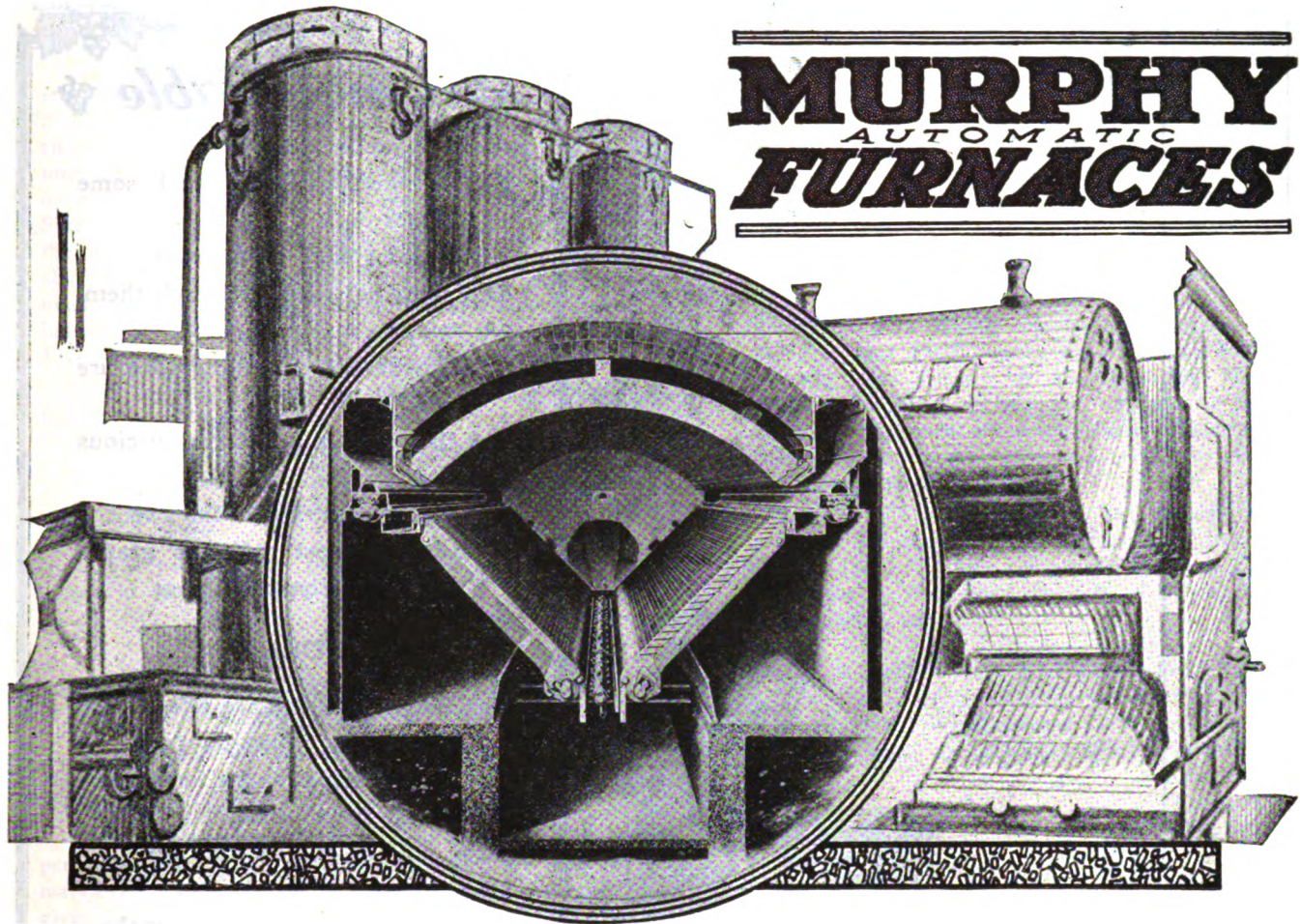
ASHLAND, KY.

Established 1866

"LINE WITH THE ASHLAND LINE"

Co-operate:—Refer to The Blast Furnace and Steel Plant

For any type of Boiler



Any boiler from 50 H.P. and up can be equipped with the Murphy Furnace. The smaller plant can therefore enjoy all the economical advantages of the larger plant without resorting to forced draft.

The money you save on auxiliary equipment goes far toward paying for an installation of Murphy Furnaces.

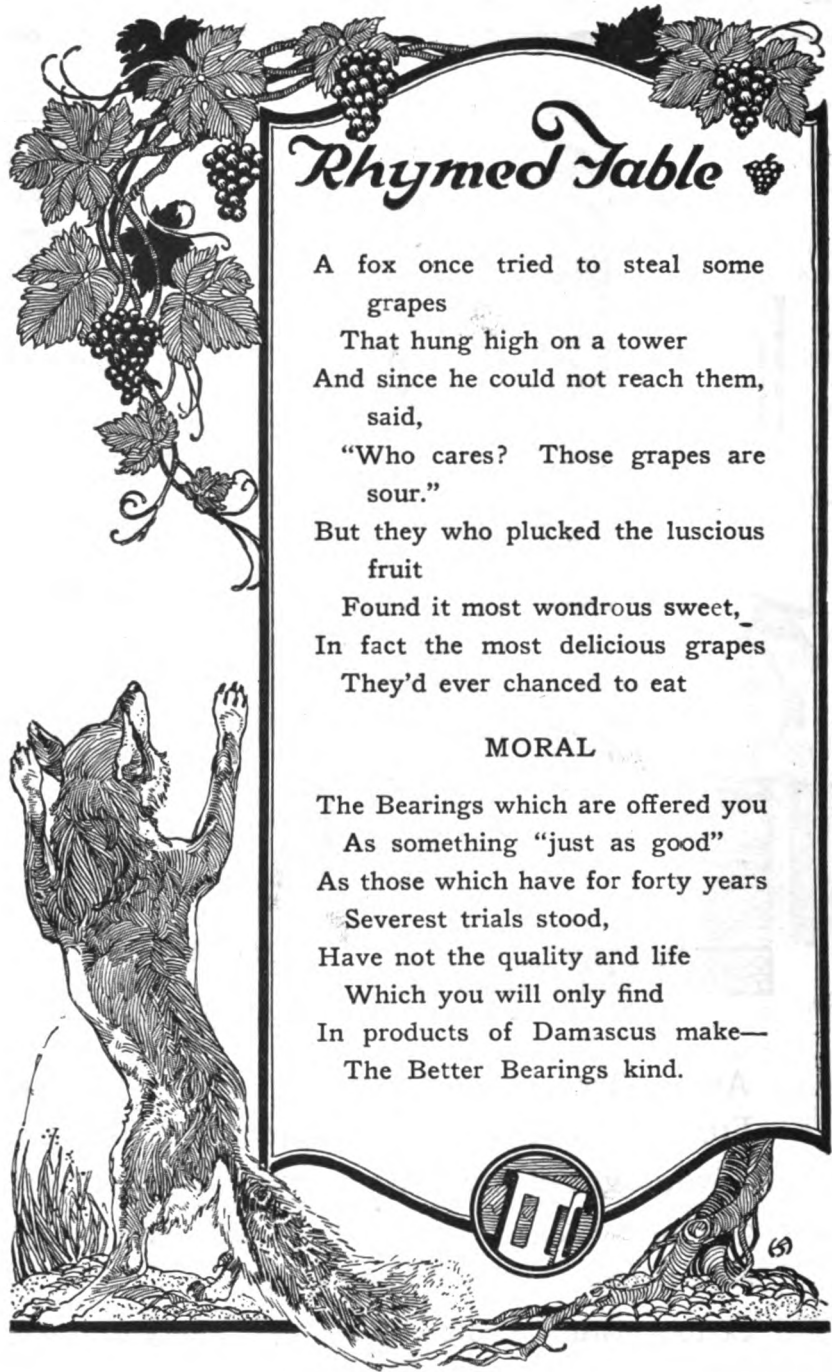
Couple Natural Draft with Murphy ability to *burn any fuel that has heat in it* and you have a simple explanation of Murphy economy in hundreds—yes, thousands of plants.

If your boilers are 50 H.P. or larger you should write us. Catalog B-8 places you under no obligation. Send for copy and see how easily the Murphy Furnace can be installed under any type of boiler.

MURPHY IRON WORKS, Detroit, Mich., U. S. A.

BURN ANY FUEL THAT HAS HEAT IN IT

Co-operate:—Refer to The Blast Furnace and Steel Plant



Rhymed Fable

A fox once tried to steal some
grapes
That hung high on a tower
And since he could not reach them,
said,
"Who cares? Those grapes are
sour."
But they who plucked the luscious
fruit
Found it most wondrous sweet,
In fact the most delicious grapes
They'd ever chanced to eat

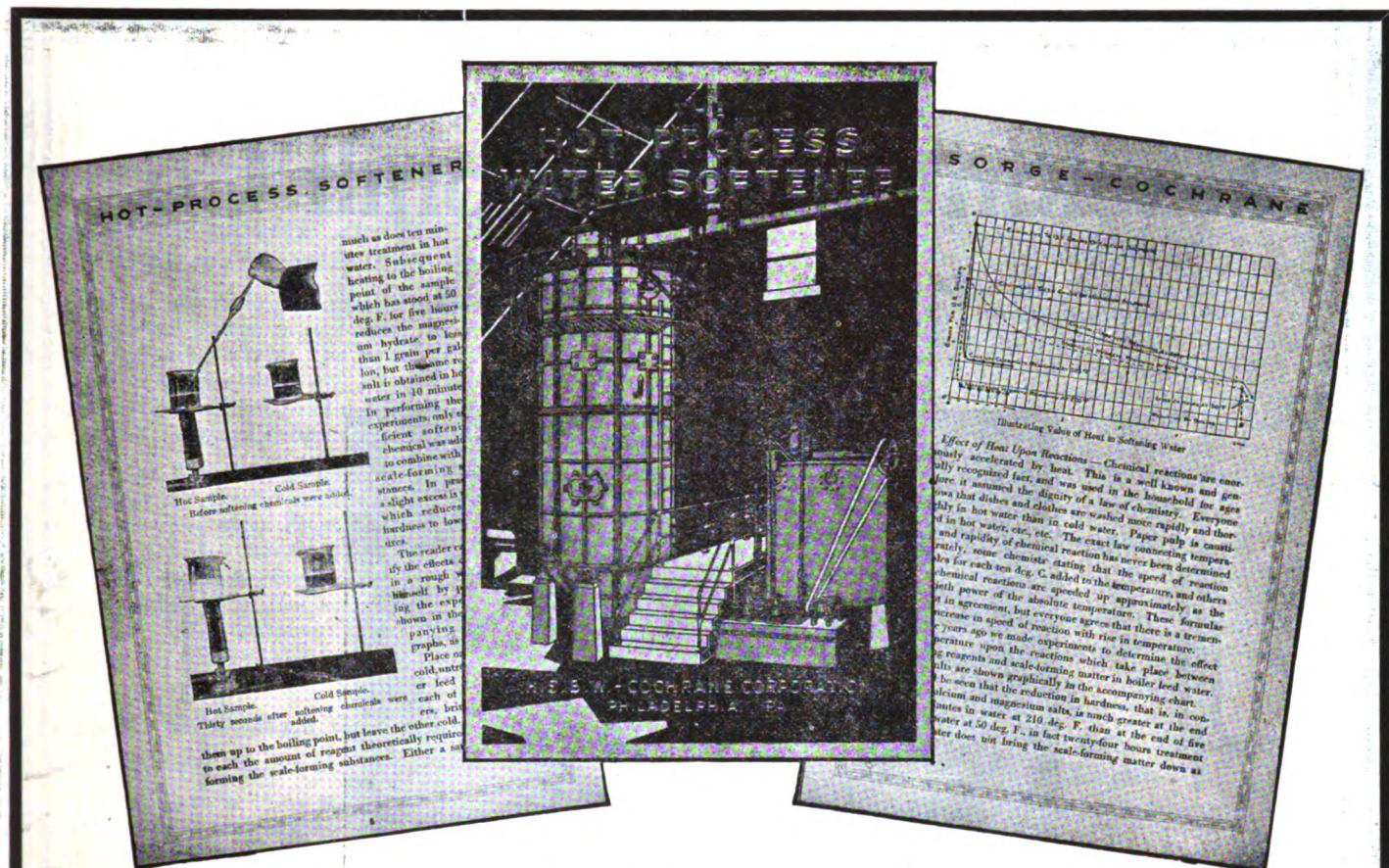
MORAL

The Bearings which are offered you
As something "just as good"
As those which have for forty years
Severest trials stood,
Have not the quality and life
Which you will only find
In products of Damascus make—
The Better Bearings kind.

Ask for information and quotations
on Bearings for every purpose.

DAMASCUS BRONZE CO.
PITTSBURGH

Co-operate:—Refer to The Blast Furnace and Steel Plant



If You Own Or Manage Steam Boilers You Should Read This Book

It is a treatise on the modern science of softening water for feeding boilers.

It explains the effects of heat upon chemical reactions, showing that calcium carbonate and magnesium hydrate are reduced more in ten minutes in hot water than after five hours in water at 60° F.

It explains why precipitates settle more rapidly in hot water than in cold water, in accordance with the fact that the viscosity of water is six times greater at 32° F. than at 212° F.

Analyses of water before and after treatment in Sorge-Cochrane Hot Process Softeners are cited to demonstrate the superior results obtained in the practical application of these principles. In most cases the total encrusting solids are reduced to less than two grains per gallon.

The problem of feeding chemicals into a Hot Process Softener, which should be operated under back pressure, is analyzed and a practical and efficient proportioner which feeds chemical solution in proportion to the raw water with an accuracy within one-half of 1% is described.

The adaptability of the hot process softener to various steam plant conditions and the advantages gained by the use of soft water in boilers in the way of protection against overheating of the metal, saving in fuel and saving in cost of cleaning boilers are discussed.

The various harmful substances found dissolved in boiler feed boilers are described and the chemistry of their removal, together with the cost of various reagents required are given.

If you are interested in these and allied subjects, ask for publication No. 933-F.

H. S. B. W.-COCHRANE CORPORATION

Formerly Harrison Safety Boiler Works

3223 North 17th Street, Philadelphia, Pa.

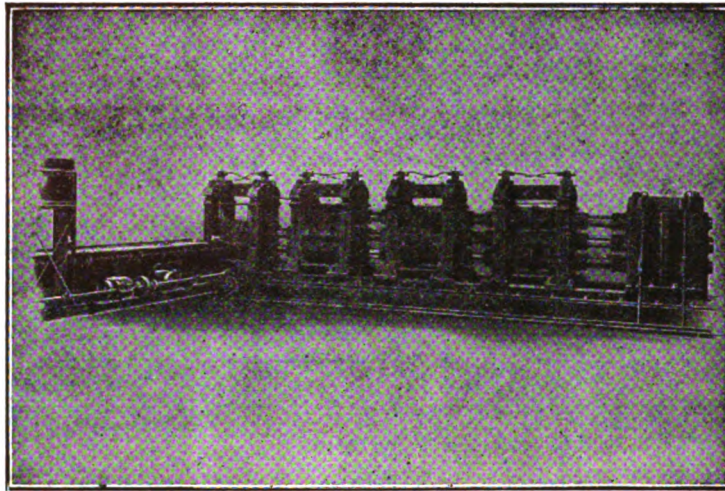
Manufacturers of the celebrated Cochrane lines, including open feed water heaters, steam-stack and cut-out, valve heaters and receivers, metering heaters, and independent meters. Sorge-Cochrane hot-process water softeners, steam and oil separators, and multiport back-pressure, atmospheric relief, flow and check valve.

66

Co-operate:—Refer to The Blast Furnace and Steel Plant

Mackintosh-Hemphill Co.

Pittsburgh, Pennsylvania



28" Structural Mill.

Complete Equipment for Rail and Structural Mills

Manganite—Rolls—Steel

“The Best in Rolling Mill Machinery”

Co-operate:—Refer to The Blast Furnace and Steel Plant

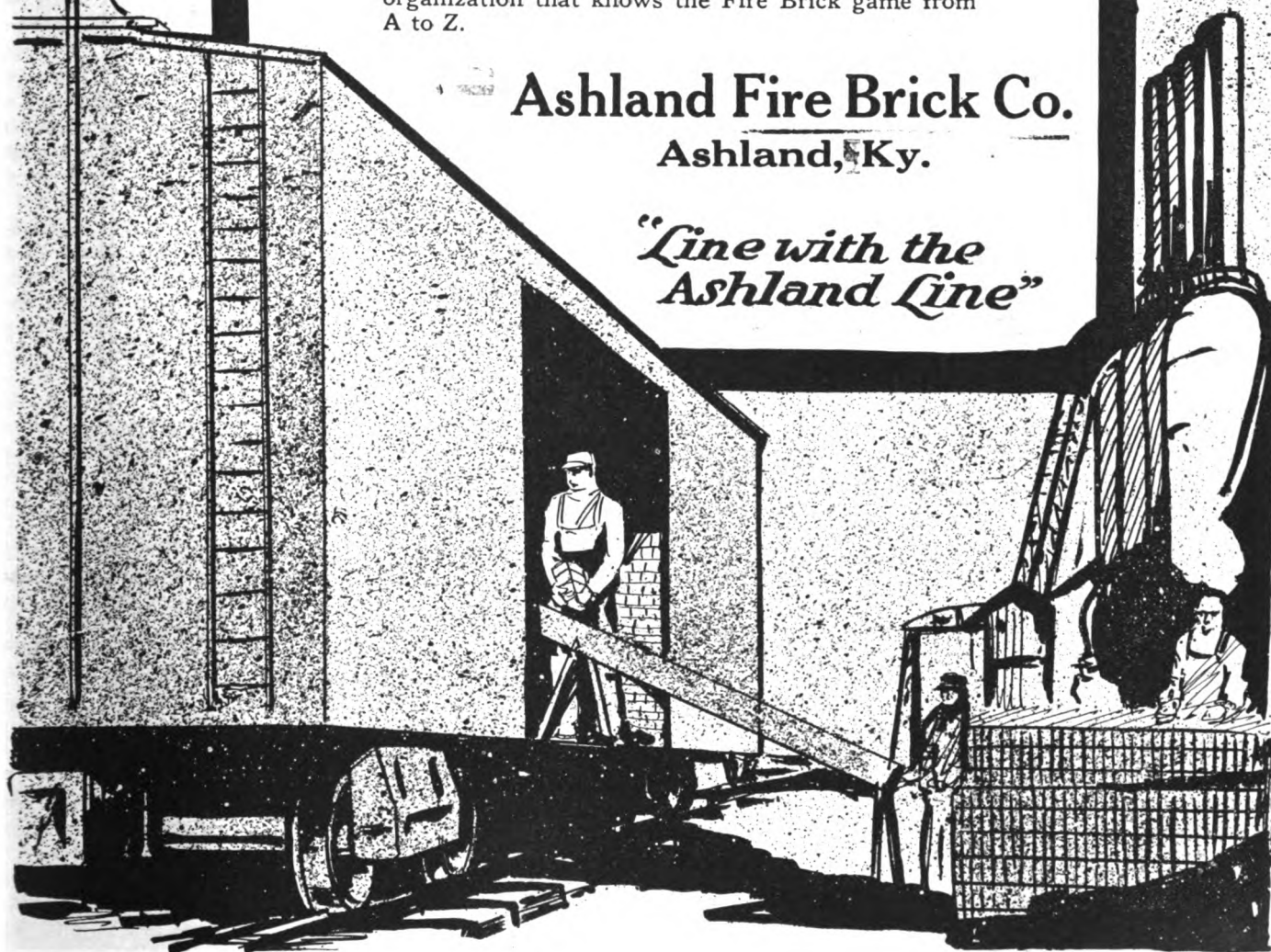
Avoid Winter Tieups and
Embargoes by Getting Your

ASHLAND FIRE BRICK

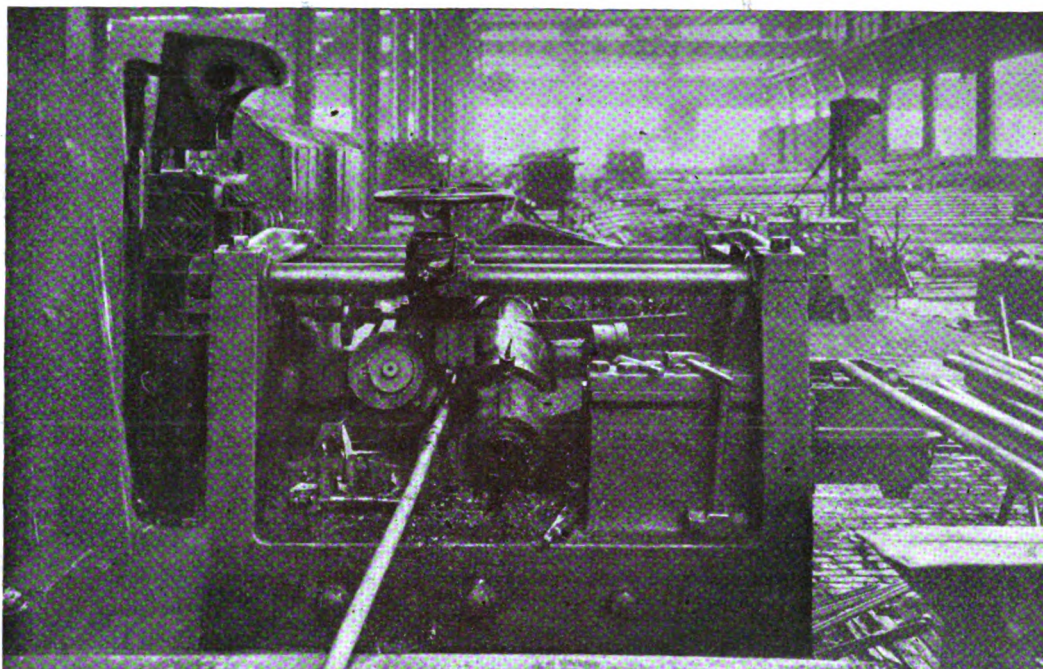
Don't wait until the snow flies before putting through that order for your Ashland Fire Brick. Orders placed now will allow us time to make deliveries on brick that will be needed later on, thus eliminating a possible delay when it comes time to line your furnaces. Delay now may require you to resort to a "substitute" later, thereby losing the opportunity of having your furnaces lined with the Ashland Fire Brick made from Carter County (Kentucky) Clays, the Country's best clay deposits and moulded into Fire Brick by an experienced organization that knows the Fire Brick game from A to Z.

Ashland Fire Brick Co.
Ashland, Ky.

*"Line with the
Ashland Line"*



Co-operate:—Refer to The Blast Furnace and Steel Plant



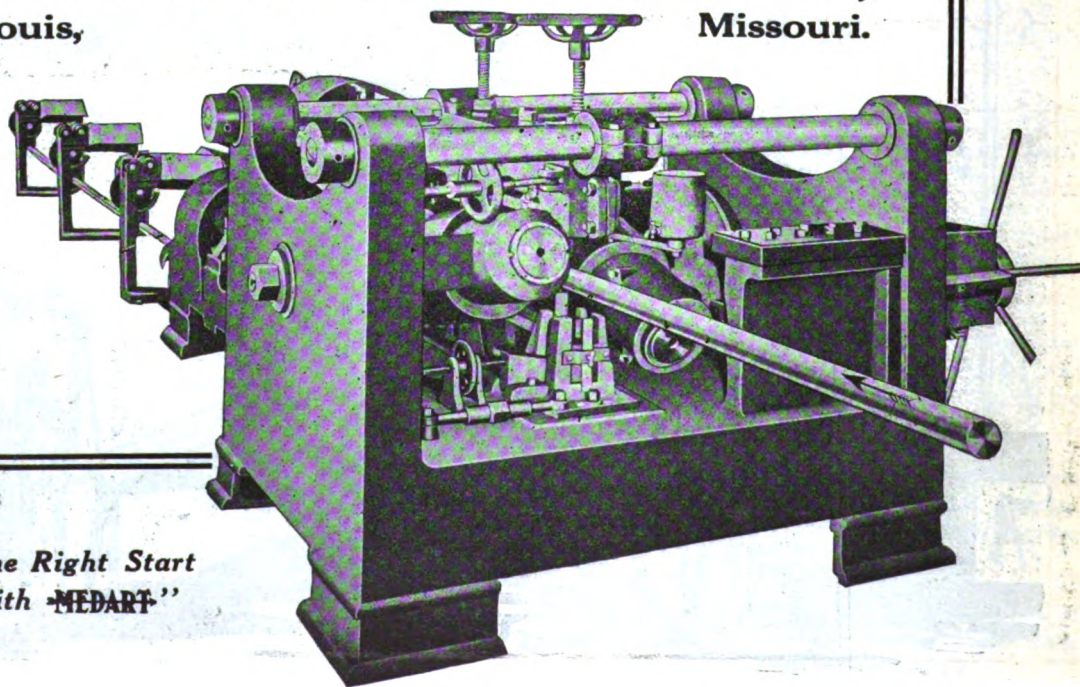
The above illustration shows one of the Medart Straighteners at the plant of the Bethlehem Steel Company, Bethlehem, Pa. These machines are operated by ordinary labor and are cutting straightening cost by straightening, polishing, and cold rolling in one operation.

MEDART Continuous Automatic Bar Straighteners

Operate continuously and will straighten any length bar diameter $1/16"$ to 6 from 40 to 80 feet per minute. All that is necessary in the way of finishing bars after turning either in the Medart Turning Machine, lathes or any other turning device, is to pass them through the Medart Straightener. This removes all tool-marks, restraightens, and puts on a very high polish. There is no chucking device. Consequently, the "Medart" straightens the bar to the extreme end. Very heavy and rigid. "Fool-proof."

Your request will bring full information to you.

MEDART PATENT PULLEY CO.,
St. Louis, Missouri.



**"To get the Right Start
—Equip with MEDART—"**

Co-operate:—Refer to The Blast Furnace and Steel Plant



Rhymed ♣ Fable

A Pilgrim to Damascus one day found
A Sword of shining steel upon the ground.

"O, Blade, what man hath lost thee from
his side?"

The Pilgrim asked. To him the Sword
replied:

"Of losing me just one man feels the cost,
But by my edge have many lives been
lost."

MORAL

An evil man with dangerous weapons may
Cause ruin and disaster in his day;
And so may man's inventions, if not good,
Destroy man's work which might for
years have stood.

Poor bronze will cause you trouble and
delay—

Damascus Better Bearings always pay.

Ask for information and quotations
on Bearings for every purpose.

DAMASCUS BRONZE CO.
PITTSBURGH

Co-operate:—Refer to The Blast Furnace and Steel Plant

6726 KOPPERS COKE OVENS

IN OPERATION OR UNDER CONSTRUCTION
IN THE UNITED STATES AND CANADA
HAVE AN AGGREGATE ANNUAL
CARBONIZING CAPACITY OF MORE THAN

43,000,000 NET TONS OF COAL

Owner or Operator	Location	Number of Ovens
United States Steel Corporation		
Illinois Steel Company	Joliet, Ill.	280
Illinois Steel Company	Gary, Ind.	700
Tennessee Coal Iron & R. R. Company	Fairfield, Ala.	434
Minnesota Steel Company	Duluth, Minn.	90
Carnegie Steel Company	Clairton, Pa.	768
American Steel & Wire Company	Cleveland, O.	180
National Tube Company	Lorain, O.	208
Woodward Iron Company	Woodward, Ala.	170
Coal Products Mfg. Company	Joliet, Ill.	35
Algoma Steel Corporation, Ltd.	Sault Ste. Marie, Ont.	110
Inland Steel Company	Indiana Harbor, Ind.	130
Republic Iron & Steel Company	Youngstown, O.	143
Bethlehem Steel Company	Sparrows Point, Md.	360
Bethlehem Steel Company	South Bethlehem, Pa.	424
Bethlehem Steel Company	Steelton, Pa.	60
Laclede Gas Light Company	St. Louis, Mo.	56
Cambria Steel Company	Johnstown, Pa.	92
Toledo Furnace Company	Toledo, O.	94
Youngstown Sheet & Tube Company	Youngstown, O.	306
LaBelle Iron Works	Follansbee, W. Va.	94
United Furnace Company	Canton, O.	47
River Furnace Company	Cleveland, O.	204
Brier Hill Steel Company	Youngstown, O.	84
Gulf States Steel Company	Gadsden, Ala.	37
Seaboard By-Product Coke Company	Jersey City, N. J.	165
Minnesota By-Product Coke Company	St. Paul, Minn.	65
Colorado Fuel & Iron Company	Pueblo, Colo.	120
Indiana Coke & Gas Company	Terre Haute, Ind.	30
Dominion Iron & Steel Company, Ltd.	Sydney, N. S.	180
Providence Gas Company	Providence, R. I.	40
Jones & Laughlin Steel Company	Pittsburgh, Pa.	300
Rainey-Wood Coke Company	Swedeland, Pa.	110
Birmingham Coke & By-Products Company	Birmingham, Ala.	50
Donner Union Coke Corporation	Buffalo, N. Y.	150
Domestic Coke Corporation	Fairmont, W. Va.	60
Pittsburgh Crucible Steel Company	Midland, Pa.	100
Chicago By-Product Coke Company	Chicago, Ill.	100
Milwaukee Coke & Gas Company	Milwaukee, Wis.	150

THE KOPPERS COMPANY

PITTSBURGH, PA.

BUILDERS OF BY-PRODUCT COKE PLANTS

Co-operate:—Refer to The Blast Furnace and Steel Plant

Let the Cochrane Engineers Help You



AT the bottom of this page is a list of the cities in which the Cochrane Engineers have offices. You can find the street address by looking up "Harrison Safety Boiler Works," or "H. S. B. W.—Cochrane Corporation," in the telephone directory.

The Cochrane Engineers are experts in the profitable utilization of exhaust steam and the heating, metering and softening of water.

They can give you **suggestions** on these subjects **that will work**, because they have training, skill and experience in such matters. Some of them have been at it for more than thirty years.

In other words, when it comes to improving the efficiency of a steam plant through the use of Open

Feed-Water Heaters, Feed-Water Heaters and Receivers, Metering Heaters, Hot and Cold Process Water Softeners, Independent V-Notch Meters, Steam and Oil Separators, Back-pressure and Atmospheric Relief Valves, or Low Pressure Drainers or Traps, they can secure the very best results for you **because they know how.**

If you are not at the present moment in need of equipment or engineering advice, but wish to study the subject up for the future, describe your plant and conditions and we will send you appropriate literature, as our treatise on "The Profitable Utilization of Exhaust Steam," "Finding and Stopping Waste in Modern Boiler Plants," "The Hot-Process Water Softener," "The Design and Use of Steam and Oil Separators," "Back Pressure Valves and Their Uses," etc.

H. S. B. W.—COCHRANE CORPORATION

Formerly
HARRISON SAFETY BOILER WORKS

3223 N. 17TH STREET

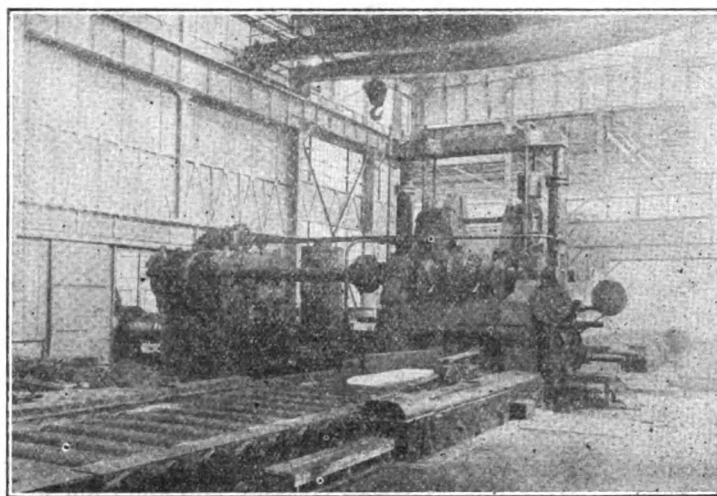
PHILADELPHIA, PA.

ATLANTA, BALTIMORE, BIRMINGHAM, BOSTON, CHARLOTTE, CHICAGO, CINCINNATI, CLEVELAND, DALLAS, DENVER, DETROIT, HOUSTON, INDIANAPOLIS, KANSAS CITY, LOS ANGELES, MINNEAPOLIS, NEW ORLEANS, NEW YORK CITY, OMAHA, PITTSBURGH, PORTLAND, RICHMOND, ST. LOUIS, SALT LAKE CITY, SAN ANTONIO, SAN FRANCISCO, SEATTLE, SYRACUSE, TUCSON, TORONTO, MONTREAL, HALIFAX, CALGARY, VANCOUVER, WINNIPEG, PARIS, CALCUTTA, HAVANA, SHANGHAI.

Mackintosh, Hemphill Co.

Pittsburgh, Pa.

"The Best in Rolling Mill Machinery"



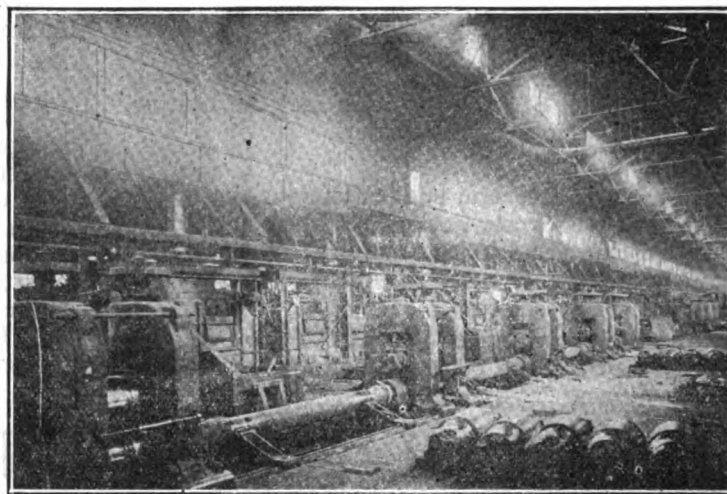
30"x42" Universal Mill.

ROLLING MILLS

Blooming Mills
 Universal Mills
 for Slabs or Plates
 Structural Mills
 Rail Mills
 Plate Mills
 Sheet Mills
 Merchant Mills

Saws
 Shears
 Presses

Cast and Cut Teeth
 Gears and Pinions

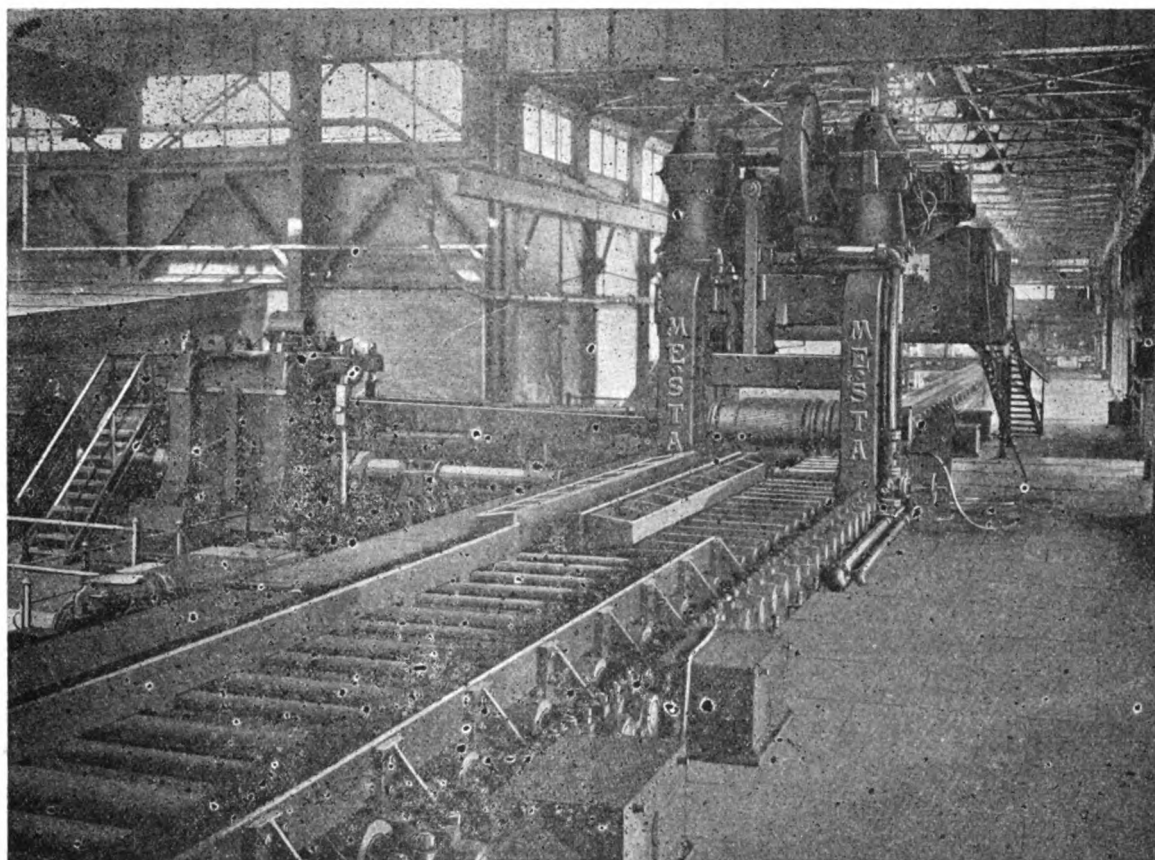


28" Tin Plate Mill.

Steel and Manganite Rolls

Co-operate:—Refer to The Blast Furnace and Steel Plant

MESTA BLOOMING-MILLS



40" Mesta Blooming Mill Installation

Designed and Built for Maximum Production

A DELAY in the operation of the Blooming Mill not only means a decrease in production and increase in cost of material being rolled; but very often causes delays and added expense in other departments that are dependent upon the Blooming Mill for material.

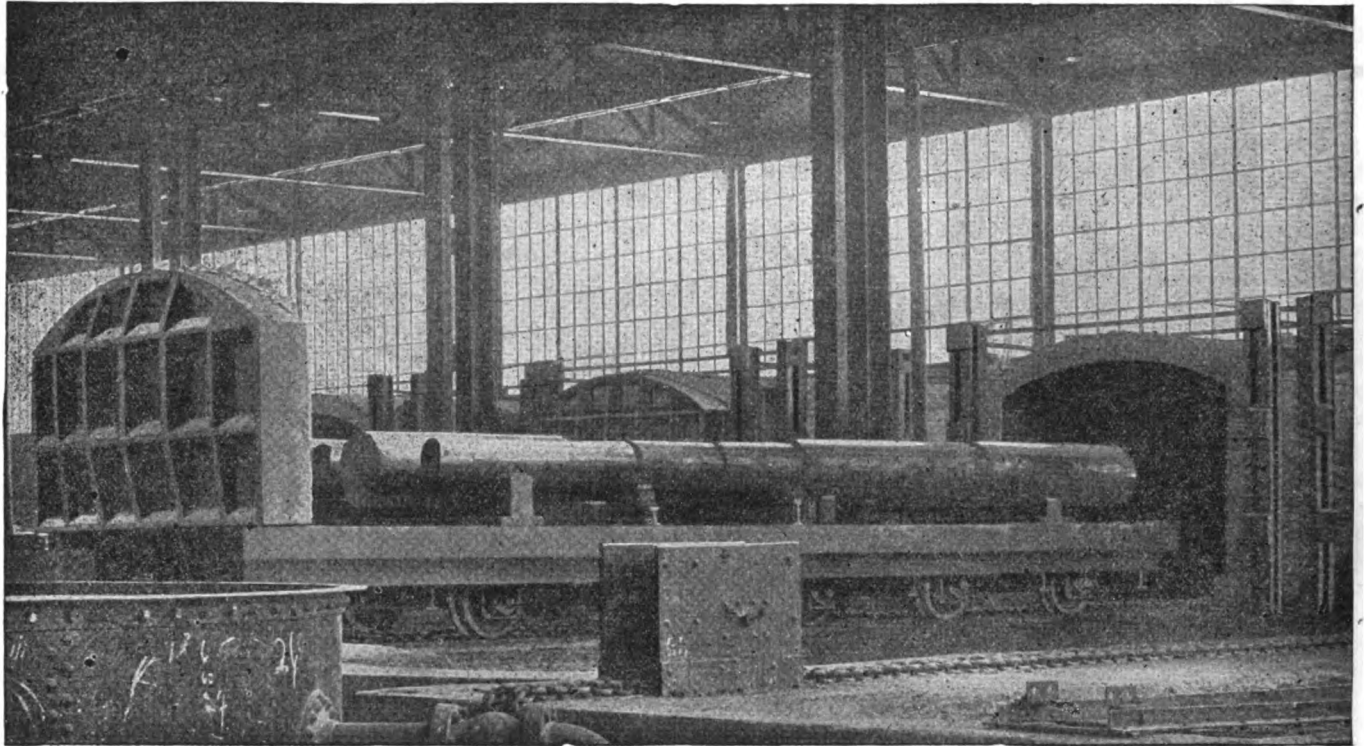
Mesta Patented Universal Spindles and Couplings, with Spindle Shifting Device which permit quick roll change; quick acting Screw Down; Forged Steel Spindles and many other distinctive features with respect to design and material used, insure continuous operation to the greatest possible extent and practically eliminate the possibility of any serious delay.

MESTA MACHINE COMPANY
PITTSBURGH PENNSYLVANIA

Co-operate:—Refer to The Blast Furnace and Steel Plant

EASTON CARS

for every industrial service



Annealing Furnace Cars, Charging Box, Ingot, and Billet Cars powerfully built to last long under the heaviest steel mill and blast furnace service.

Core Oven and other cars of superior design to meet any foundry requirements—usual or unusual.

Turntables, switches, track, and all industrial railway accessories.

Whether it's a single car or a complete equipment,

It's sure to be "right" if it's Easton.

EASTON ENGINEERING SERVICE

Easton Engineering Service is at your disposal, without fee or obligation. Easton Bulletins, too, await your inquiry.

EASTON CAR & CONST'N CO.



2083-E

44 Church St., New York

Works: Easton, Pa.

Boston

Chicago

Detroit

Philadelphia

Pittsburgh

Co-operate:—Refer to The Blast Furnace and Steel Plant

Back of **ASHLAND FIRE BRICK**

CARTER COUNTY

Carter County, (better known as the Olive Hill Clay District), long reputed for its uniform Fire and Flint Clays is the starting place of Ashland Refractory Service. Refractory experts, Furnace engineers and builders know the natural qualities of these clays to be best adapted to steel industry operation.

Having the best materials obtainable for the basic element the Ashland Specialists have through years of experience perfected the process of manufacturing brick by the use of special machinery to a high standard that can be only uniform and right for the service they are made, thus insuring to the user of Ashland products the best that materials, machinery and skilled personell can produce.

If long service and uninterrupted production is your idea of refractory service, get in touch with the

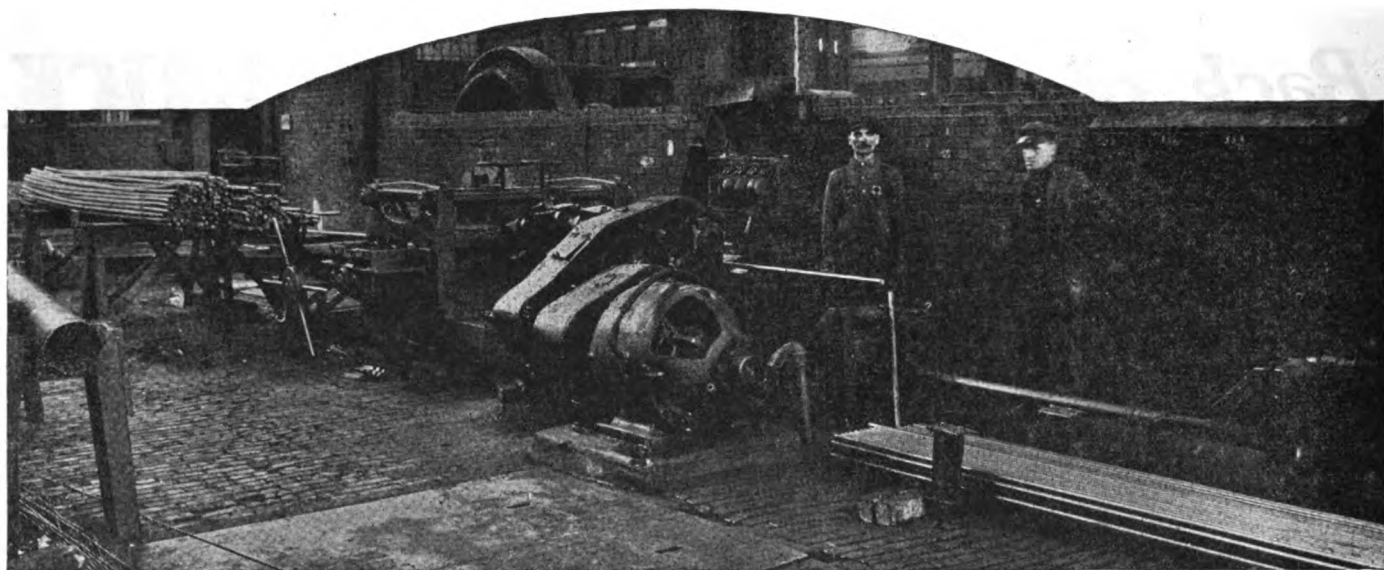
Ashland Fire Brick Co.

Ashland, Ky.

Incorporated 1886

Line with the **ASHLAND LINE**

Co-operate:—Refer to The Blast Furnace and Steel Plant



The above illustration shows but one of the Medart Bar Straighteners installed at the plant of the Bethlehem Steel Co., South Bethlehem, Pa. In this thoroughly modern and progressive plant machines must "make good" or out they go, regardless of cost. Medart Straighteners have "stayed" and are saving labor, time and money by straightening, polishing and cold rolling bars in one operation.

MEDART

**Continuous
Automatic**

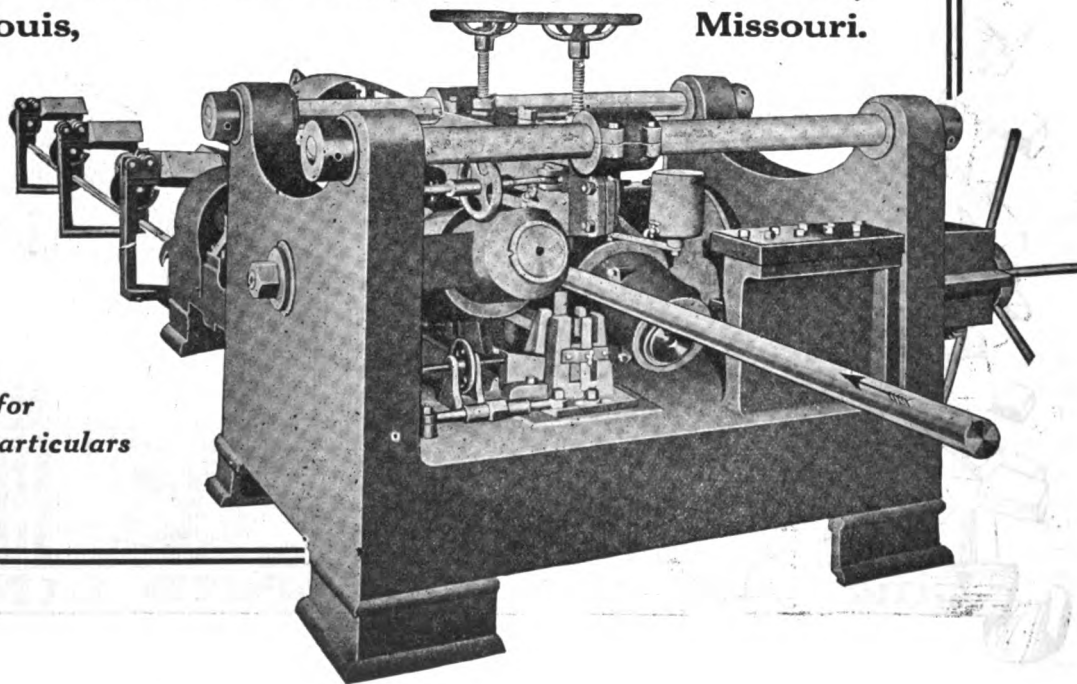
BAR STRAIGHTENERS

operate continuously; one bar following another as closely as possible. They can be operated by ordinary labor and straighten from 1/16 to 6" bars from 40 to 80 feet per minute. Any length bar can be straightened.

"To get the Right Start—Equip with ~~MEDART~~"

MEDART PATENT PULLEY CO.,
St. Louis, Missouri.

*Write for
Particulars*



Co-operate:—Refer to The Blast Furnace and Steel Plant

Rhymed Fable

A Dog had stolen from a butcher's shop
A mutton bone, and, without wait or stop,
But hurrying homeward, at the river's
brink
Saw his own shadow. "Ah!" said he, "I
think
I'll capture that meat, too. Quick as the
thought
His greedy jaws snapped for the meat he
sought
But vainly, and into the river dropped his
own,
Then sadly went his meatless way with-
out a bone.

MORAL

They who for nothing would get some-
thing learn
Man's avarice upon himself will always
turn;
Dropping the substance for the shadowy
food
Hazard is the real for visionary good.
In shadowy cheapness many a loss we
trace—
Enduring merit is the saving grace.
Damascus Better Bearings, it is known
By years of test have greatest service
shown.



Ask for information and quotations
on Bearings for every purpose.

DAMASCUS BRONZE CO.
PITTSBURGH

Co-operate:—Refer to The Blast Furnace and Steel Plant

THE KOPPERS COMPANY

Designers and Builders
of
By-Product Coke Plants,
Benzol Recovery Plants,
Motor Fuel Recovery Plants,
Ammonia Recovery Apparatus,
Tar Distilling Plants,
By-Product Gas Producers.

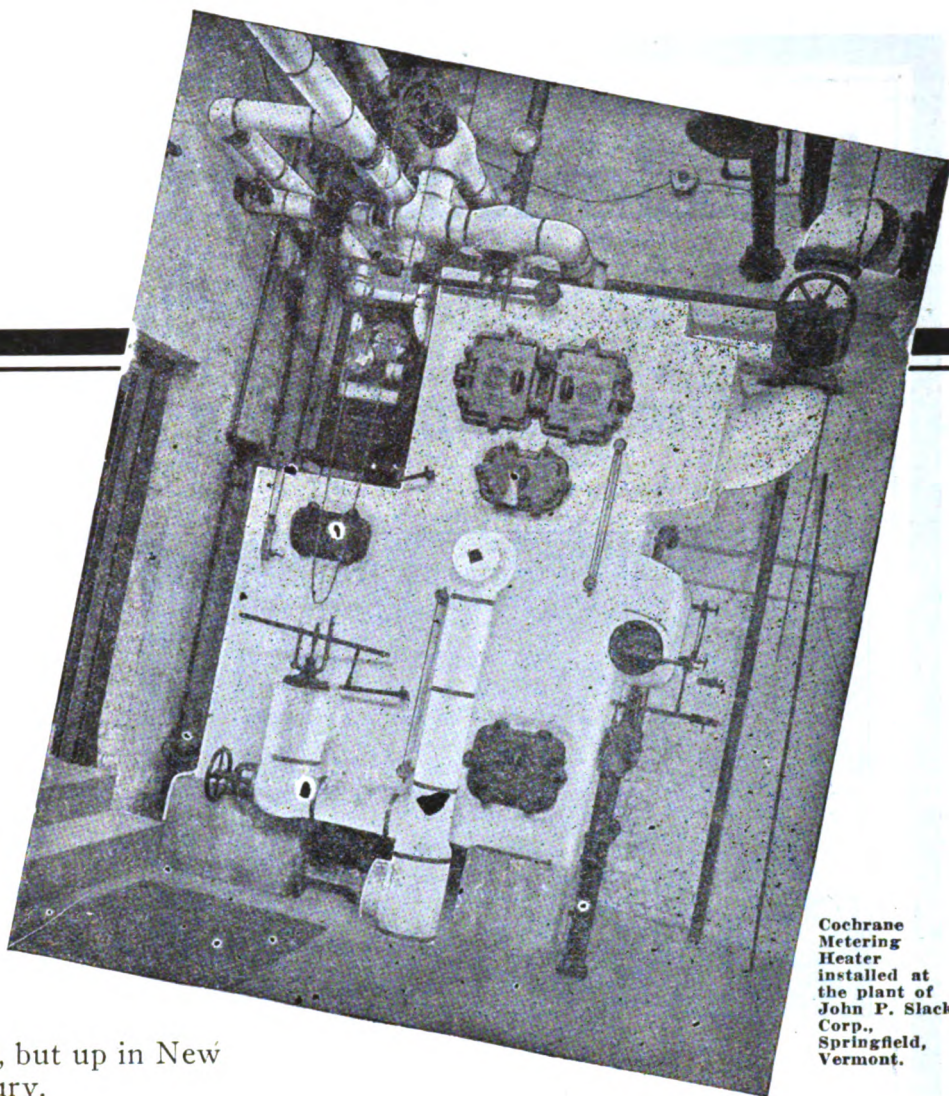
Consulting Engineers
on the operation of
By-Product Coke and Gas Plant
and their Auxiliaries

Properties Examined
Engineering Reports and Financial Statements Prepared
Coals Analyzed and Tested

THE KOPPERS COMPANY
PITTSBURGH, PA.

Co-operate:—Refer to The Blast Furnace and Steel Plant

The cash register of the coal pile



Cochrane Metering Heater installed at the plant of John P. Slack, Corp., Springfield, Vermont.

COAL is high everywhere, but up in New England it is a real luxury.

That is why the wise New Englanders are putting in Cochrane Metering Heaters like the one shown herewith for measuring the boiler feed water.

This meter, in connection with coal weighing, enables them to detect any falling off in efficiency, as due to accumulation of scale or soot on heating surfaces, defective baffles, leaking boiler settings, inexperienced firemen, inferior coal, defective grates, etc. With the Cochrane Metering Heater the improvement of evaporation resulting from changing methods or equipment is at once demon-

strated. For example the best frequency for boiler cleaning can be demonstrated by setting off the cost of cleaning against the value of the fuel saved.

In other plants the Cochrane Independent Meters are being installed to measure the steam consumption of turbines or the returns from heating systems or processes in order to make the proper charges for the use of steam.

Have you read our book on "Finding and Stopping Waste in Modern Boiler Rooms?" It is sent free upon request.

H. S. B. W.—COCHRANE CORPORATION

Formerly Harrison Safety Boiler Works
3223 N. 17th Street, PHILADELPHIA, PA.

ATLANTA, BALTIMORE, BIRMINGHAM, BOSTON, CHARLOTTE, CHICAGO, CINCINNATI, CLEVELAND, DALLAS, DENVER, DETROIT, HOUSTON, INDIANAPOLIS, KANSAS CITY, LOS ANGELES, MINNEAPOLIS, NEW ORLEANS, NEW YORK CITY, OMAHA, PITTSBURGH, PORTLAND, RICHMOND, ST. LOUIS, SALT LAKE CITY, SAN ANTONIO, SAN FRANCISCO, SEATTLE, SYRACUSE, TUCSON, TORONTO, MONTREAL, HALIFAX, CALGARY, VANCOUVER, WINNIPEG, PARIS, CALCUTTA, HAVANA, SHANGHAI

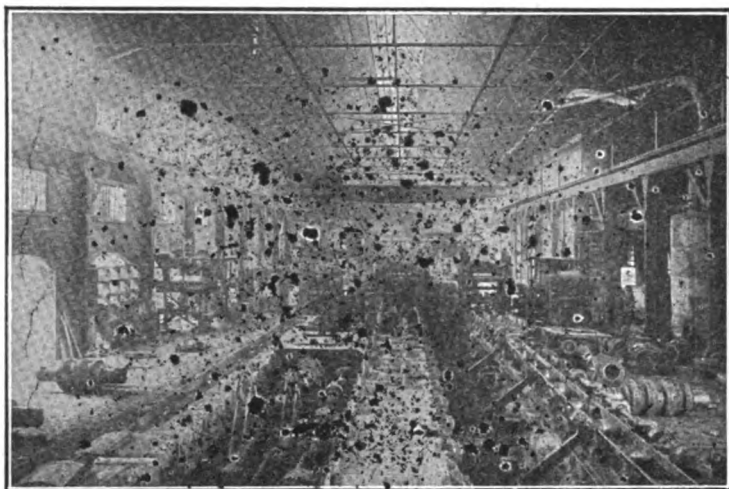
Manufacturers of the celebrated Cochrane lines, including Open Feed Water Heaters, Steam-Stack and Cut-Out Valve Heaters and Receivers, Metering Heaters, Independent V-Notch Meters, Flow Meters, Precision Meters, Weighing Meters, Sarge-Cochrane Hot Process Water Softeners, Cold Process Water Softeners, Steam and Oil Separators, Multiport Drainers and Multiport Back Pressure Atmospheric Relief, Flow and Check Valves.

Co-operate:—Refer to The Blast Furnace and Steel Plant

Mackintosh, Hemphill Co.

Pittsburgh, Pa.

"The Best in Rolling Mill Machinery"



23" Structural Mill.

ROLLING MILLS

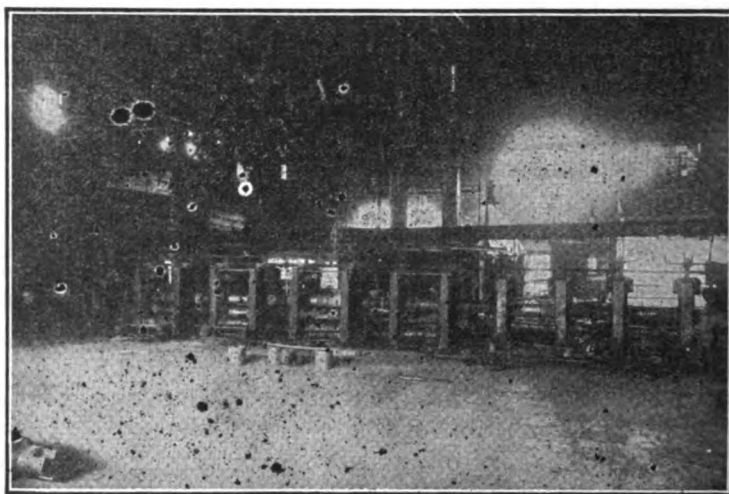
Blooming Mills
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 Rail Mills
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 Merchant Mills

Saws

Shears

Presses

Cast and Cut Teeth
 Gears and Pinions

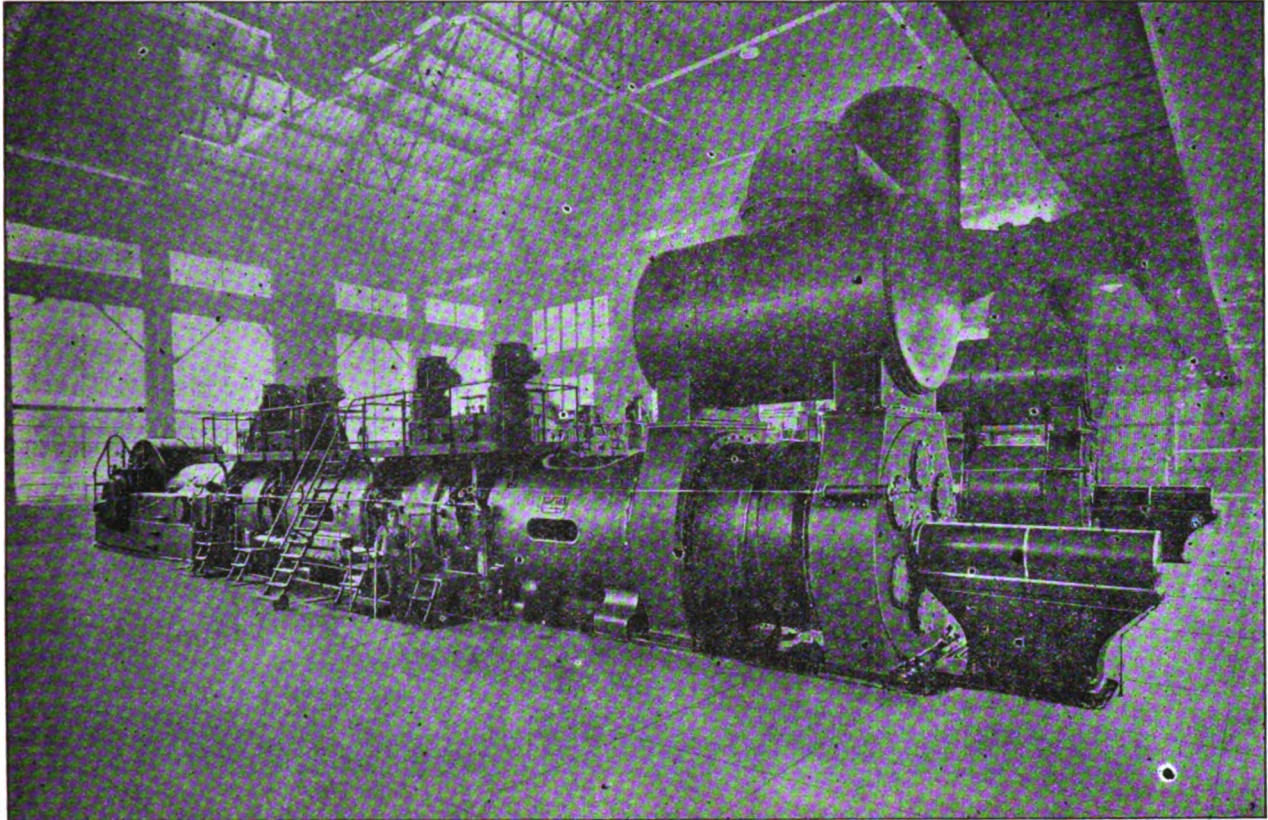


12" Bar Mill.

Steel and Manganite Rolls

Co-operate:—Refer to The Blast Furnace and Steel Plant

— M E S T A —



View showing Mesta Gas Blowing Engines built for The Bethlehem Steel Company.

BLOWING ENGINES

Gas or Steam Driven

The Recognized Standard Among Blast Furnace Engineers.

The Safest and Most Efficient Type of Blast Furnace Blowing Equipment.

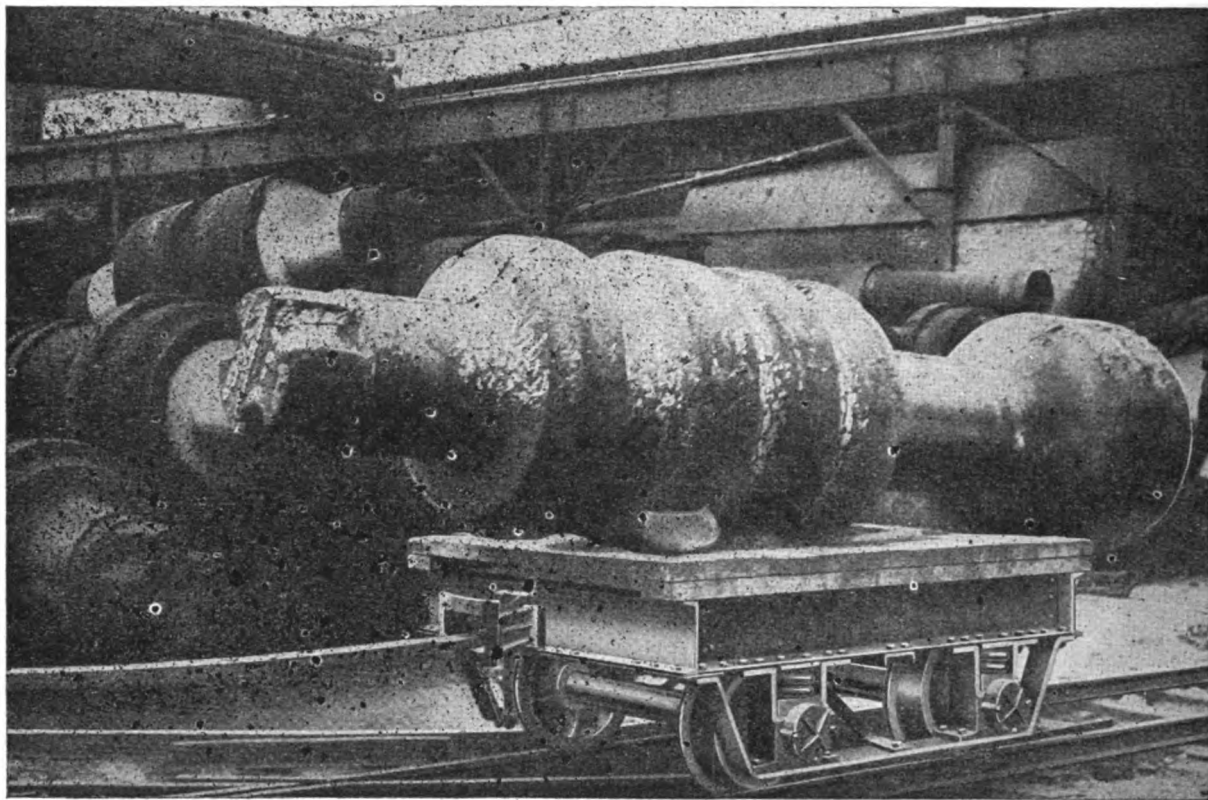
Also Manufacturers of

Gas and Steam Power Engines, Rolling Mill Machinery, Forging Presses, Gear Drives, Air Compressors, Condensers, Rolls, Pinions, Cut and Machine Molded Gears, Iron and Steel Castings, Forgings, Forging Ingots, etc.

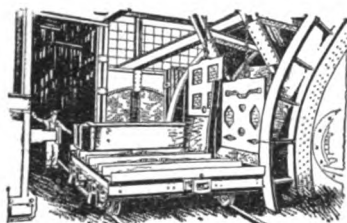
MESTA MACHINE COMPANY
PITTSBURGH **PENNSYLVANIA**

Co-operate:—Refer to The Blast Furnace and Steel Plant

EASTON INDUSTRIAL RAILWAY CARS



Measure Up to the Job



CHARGING BOX CARS

We build cars for every steel plant and rolling mill service in both the four-wheel and double-truck, or eight-wheel types of standard and special designs. Platforms made of heavy steel rails when desired.

No matter what your internal transportation problems may be—whether raw or finished materials, solids or liquids, hot or cold—or how heavy the load, you'll find Easton Cars and Railway Equipment meeting every condition fully and measuring up to the job.

Easton cars are sturdily built and give long service because they're made of quality materials by competent workmen. When the service requires it, cars are equipped with Easton roller bearings insuring fast, easy traction which means better transportation service with less maintenance and lower motor bills.

EASTON ENGINEERING SERVICE

Easton Engineers, with 30 years' experience in designing and building industrial railway systems, will give unbiased advice and make recommendations gratis. Easton Service can furnish every detail from a single car or turntable to complete equipment for the largest plants.

EASTON CAR & CONST'N CO.



2077-E

General Offices: 44 Church Street, New York
Boston Chicago Detroit

Works: Easton, Pa.
Philadelphia Pittsburgh

Co-operate:—Refer to The Blast Furnace and Steel Plant

ASHLAND FIRE BRICK

FIRE Brick linings, to exert the necessary resistance to the action of destroying influences in the process of smelting must be compounded with a view to resisting the conditions such as the finished work will meet.

Various grades of fire brick meeting these conditions cannot be equally successful. Differences in compounding will effect the fusion point and cause decided physical changes.

Getting the right fire brick for the specific condition is about the same as buying specification steel. Analysis means much. So with fire brick, Ashland Steam Pressed Fire Brick meet the requirements of furnace service successfully. They are highly refractory—non-Vitrifiable in service, contain maximum weight for standard size brick and are smooth, with no laminations.

Why not investigate the Ashland line of High Temperature Fire Brick?

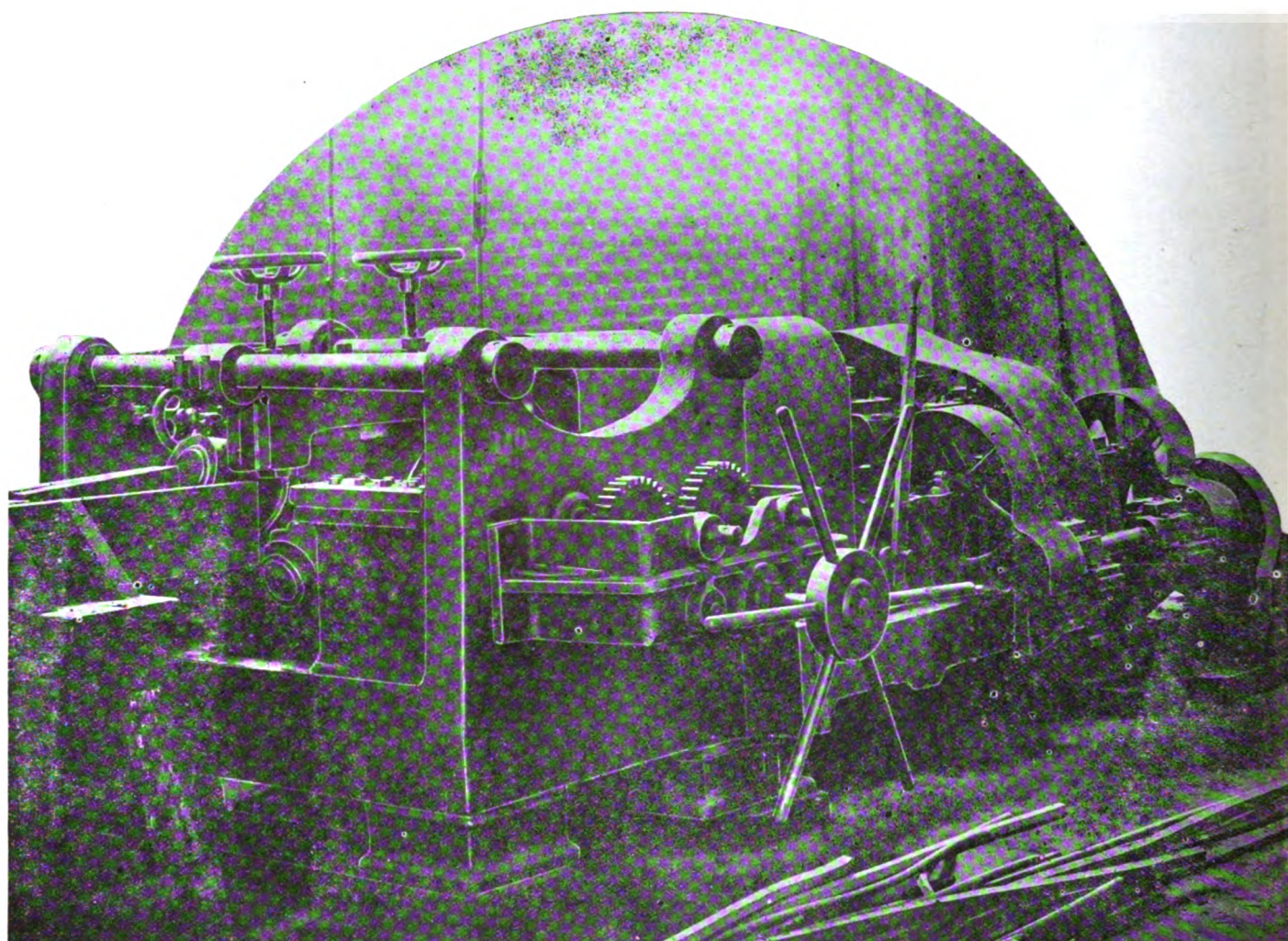
**Ashland Fire Brick
Company**

Ashland, Kentucky

Established 1886

"Line with the Ashland Line"

Co-operate:—Refer to The Blast Furnace and Steel Plant



MEDART

Continuous Automatic Bar Straighteners

Save time, labor and money by straightening, polishing and cold rolling bars in one operation. Medart straighteners operate continuously, one bar following another as closely as possible. The entire bar passes through the rolls, applying full pressure on the bar to the extreme end. This overcomes the difficulty that has been experienced with other machines and removes crooks near the ends of the bars.

Write for Medart Catalogue.

MEDART PATENT PULLEY COMPANY

ST. LOUIS

MISSOURI

"To get the Right Start - Equip with MEDART"

Co-operate:—Refer to The Blast Furnace and Steel Plant



Rhymed Table

FIS land, one time, a miser sold
And bought instead a chunk of gold;
His servants stole the precious lump
From where he hid it, 'neath a stump;
The miser, finding it not there,
In anguish raved and tore his hair.
His neighbors said, "You nothing lose,
The gold you had you did not use."

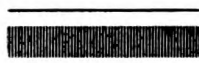
Moral:
All opportunities are naught
Unless this lesson has been taught
That only as we use a thing
Will it to us its profit bring.
Damascus Better Bearings will,
If used by you, your wants best fill.
Damascus service, too, supplies
Your special needs that may arise.

Ask for information and quotations
on Bearings for every purpose.

DAMASCUS BRONZE CO.
PITTSBURGH

Co-operate:—Refer to The Blast Furnace and Steel Plant

An installation of Koppers Triangular Flued Combination Coke and Gas Ovens is the logical one for any Steel Company that must supply an adequate Gas Supply in addition to a reliable source of high grade Coke.



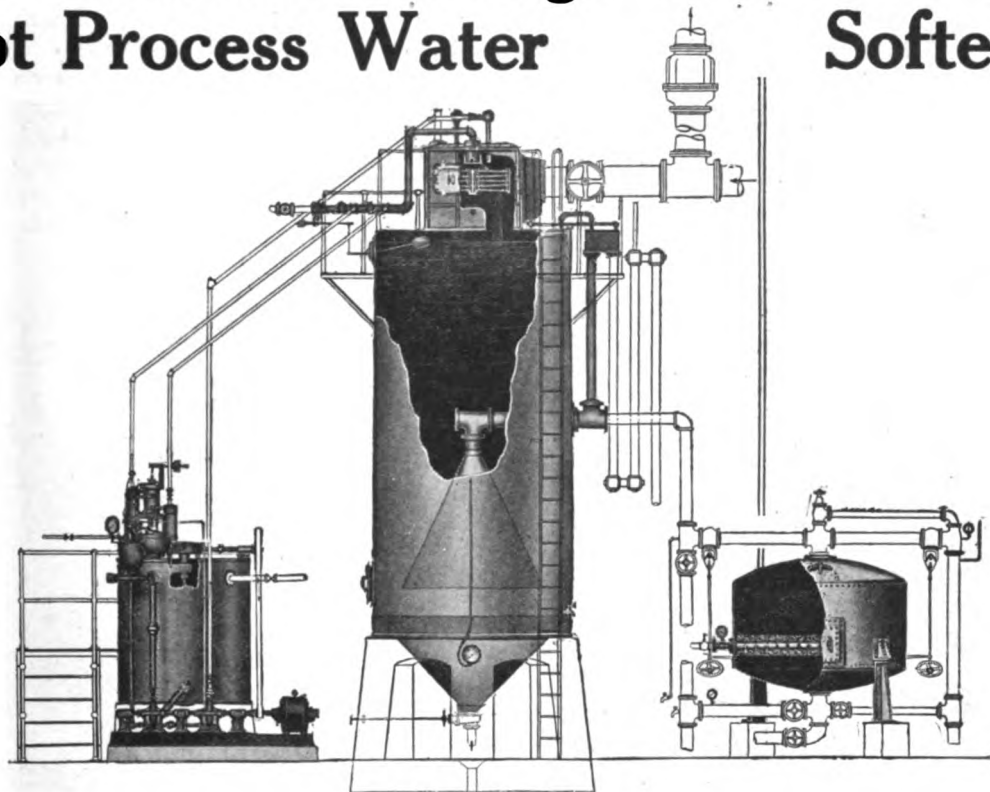
THE KOPPERS COMPANY
PITTSBURGH, PA.

Designers and Builders of By-Product Coke Plants

Co-operate:--Refer to The Blast Furnace and Steel Plant

H. S. B. W. - COCHRANE. - H. S. B. W. - COCHRANE. - H. S. B. W.

This is the Sorge-Cochrane Hot Process Water Softener



THE latest development in water softeners, treating the water hot, which results in more complete removal of scale and mud-forming substances.

Chemical reactions are almost instantaneous and sedimentation is more rapid in hot water than in cold water.

The maximum reduction of scale and sludge-forming matter is obtained, with the minimum excess of treating reagents.

There is no after precipitation, and troublesome deposits of scale and sludge in pumps, piping, feed-water heaters and boilers are avoided.

A minimum amount of sludge-forming solids enters the boiler and the tendency to priming and foaming is reduced.

Corrosion is prevented by the driving off of air and gases in the preliminary heating of the

water and by rendering the water alkaline.

Fuel is saved by heating the feed water and an independent feed water heater is rendered unnecessary.

The apparatus is more simple and more compact and involves less expense for housing, foundations and piping than does a cold process softener.

The chemical feeding equipment is reliable and accurate and is readily accessible.

The chemical tank is located at the ground level, saving the hoisting of chemicals.

All adjustments and controls are operated from the ground level.

Ask for our new Book No. L-933, explaining the scientific facts upon which the design of this water softener has been based and presenting the results obtained in practical operation in numerous large and well known plants in the United States.

H. S. B. W.-COCHRANE CORP.

Formerly Harrison Safety Boiler Works

3223 N. 17th Street

Philadelphia, Pa.

Manufacturers of the celebrated Cochrane Lines, including open feed water heaters, steam stack and cut-out valve heaters and receivers, metering heaters and independent meters. Sorge-Cochrane hot process water softeners, steam and oil separators, and multiport back pressure, atmospheric relief, flow and check valves.

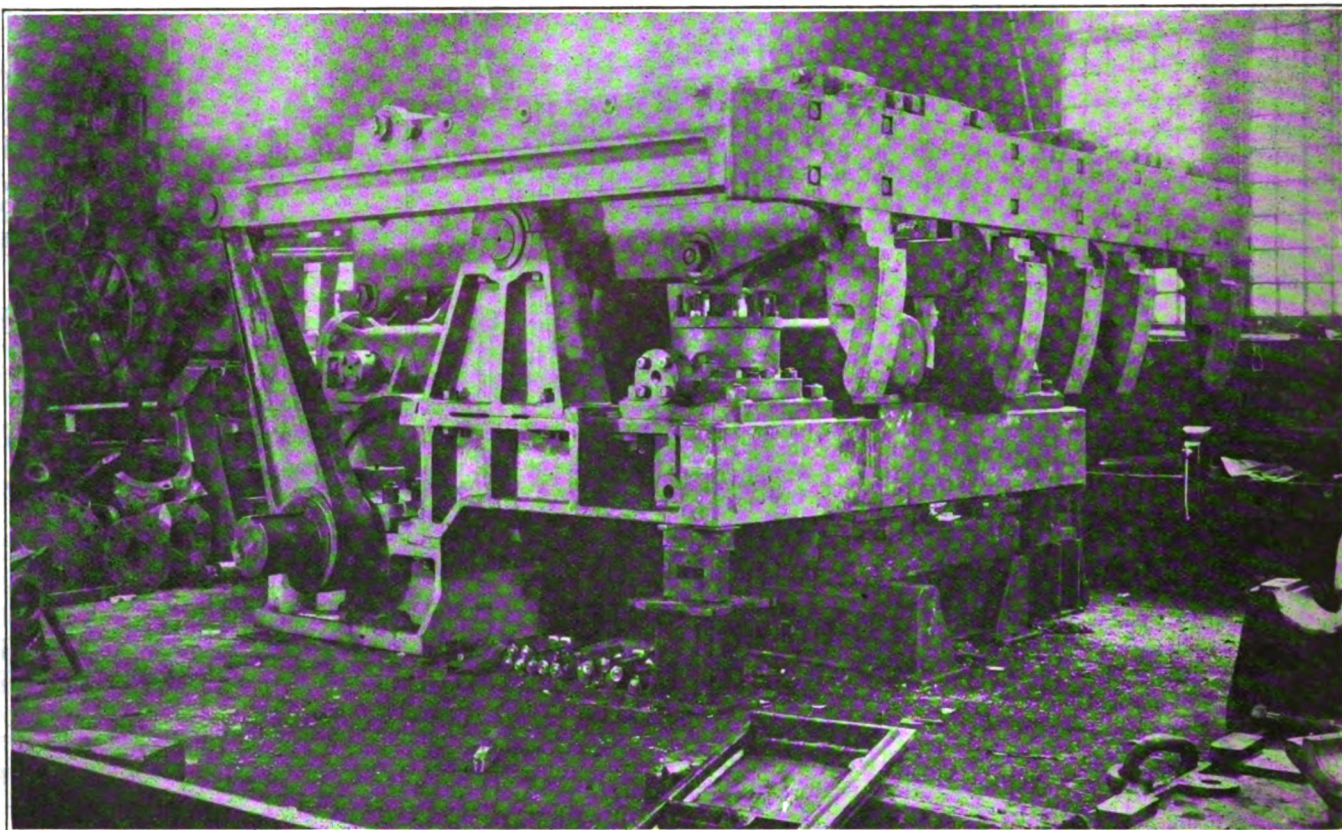
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H. S. B. W. - COCHRANE. - H. S. B. W. - COCHRANE. - H. S. B. W.

Co-operate:—Refer to The Blast Furnace and Steel Plant

Modernize Your Blooming Mill

Install the latest and best Manipulator yet devised.



"Showing one side of Manipulator for 40" Blooming Mill for India."

A side guard and finger manipulator combined.

Entirely independent of tables, away from scale, easy of access.

A rapid and successful Manipulator that boosts tonnage.

Can be applied to any mill table.

Write us:—

We can show you the advantage of making this Manipulator part of your Blooming Mill equipment.

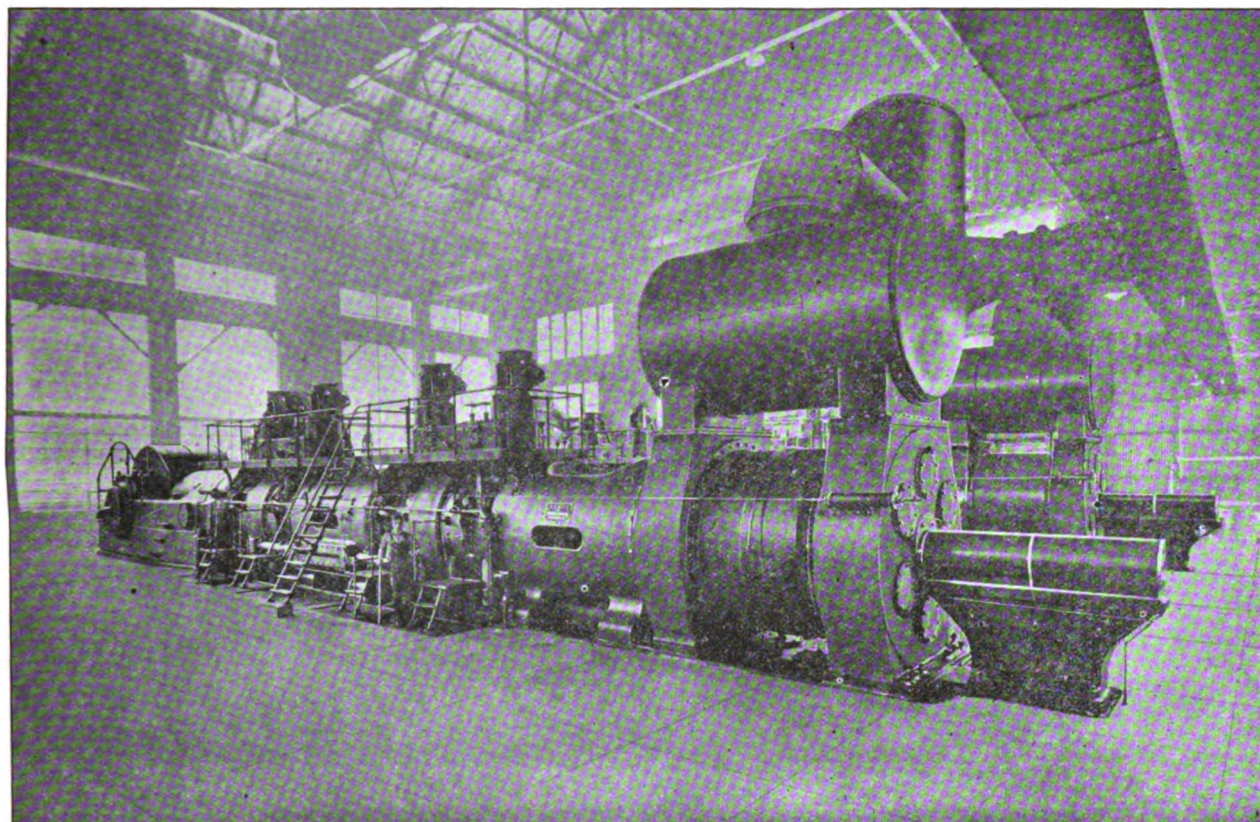
Mackintosh-Hemphill Company

Pittsburgh, Penna.

"THE BEST IN ROLLING MILL MACHINERY"

Co-operate:—Refer to The Blast Furnace and Steel Plant

MESTA



View showing Mesta Gas Blowing Engines built for The Bethlehem Steel Company.

BLOWING ENGINES

Gas or Steam Driven

The Recognized Standard Among Blast Furnace Engineers.

The Safest and Most Efficient Type of Blast Furnace Blowing Equipment.

Also Manufacturers of

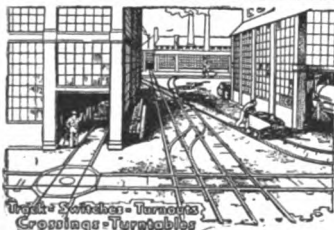
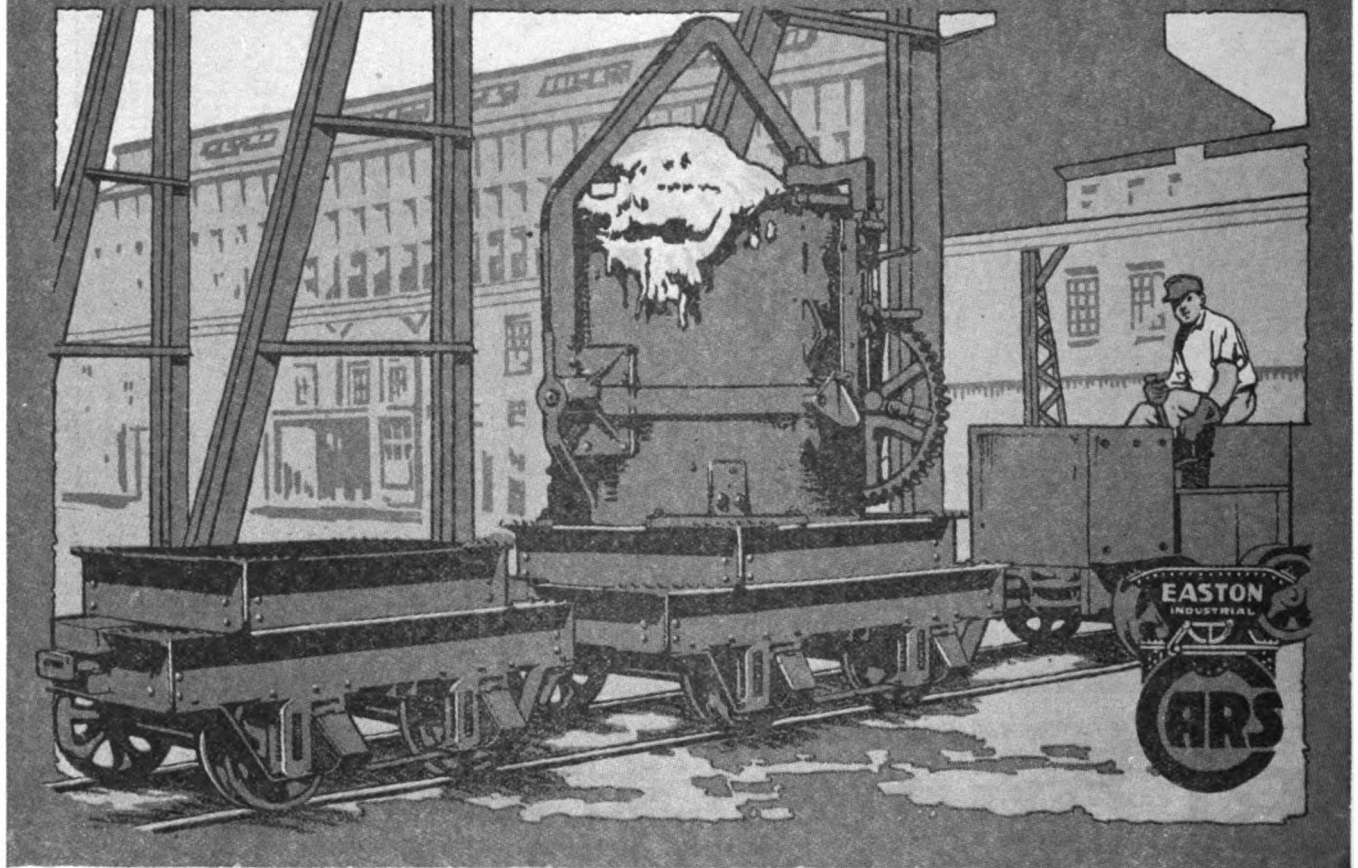
Gas and Steam Power Engines, Rolling Mill Machinery, Forging Presses, Gear Drives, Air Compressors, Condensers, Rolls, Pinions, Cut and Machine Molded Gears, Iron and Steel Castings, Forgings, Forging Ingots, etc.

MESTA MACHINE COMPANY
PITTSBURGH **PENNSYLVANIA**

Co-operate:—Refer to The Blast Furnace and Steel Plant

EASTON CARS

for every Industrial Service



TRACK

Track, switches, turnouts, crossings, cross-overs, turntables, wheels and axles, axle boxes, and roller bearings for inside or outside journals and everything necessary for Industrial Railways.

A narrow-gauge railway system connecting department to department, building to building, laid inside or out. Carrying loads heavy or light, cold or hot. Convenient, smooth-running, ever dependable, a saver of time and manpower—an EASTON.

Easton Cars and industrial railway accessories are available for meeting any haulage requirement, usual or unusual.

Whether it's a single car or a complete equipment—

It's sure to be "RIGHT" if it's EASTON

EASTON ENGINEERING SERVICE

is at your disposal, without fee or obligation.
Easton Bulletins too, await your inquiry.

EASTON CAR & CONST'N CO.



2097-E

General Offices: 44 Church Street, New York
Boston Chicago Detroit

Works: Easton, Pa.
Philadelphia Pittsburgh

Co-operate:—Refer to The Blast Furnace and Steel Plant

Bigger Production

followed the remodeling of the Low Moor Iron Company's Covington Furnace. Among the many improvements, complete linings of

ASHLAND BLAST FURNACE STEAM PRESSED FIRE BRICK

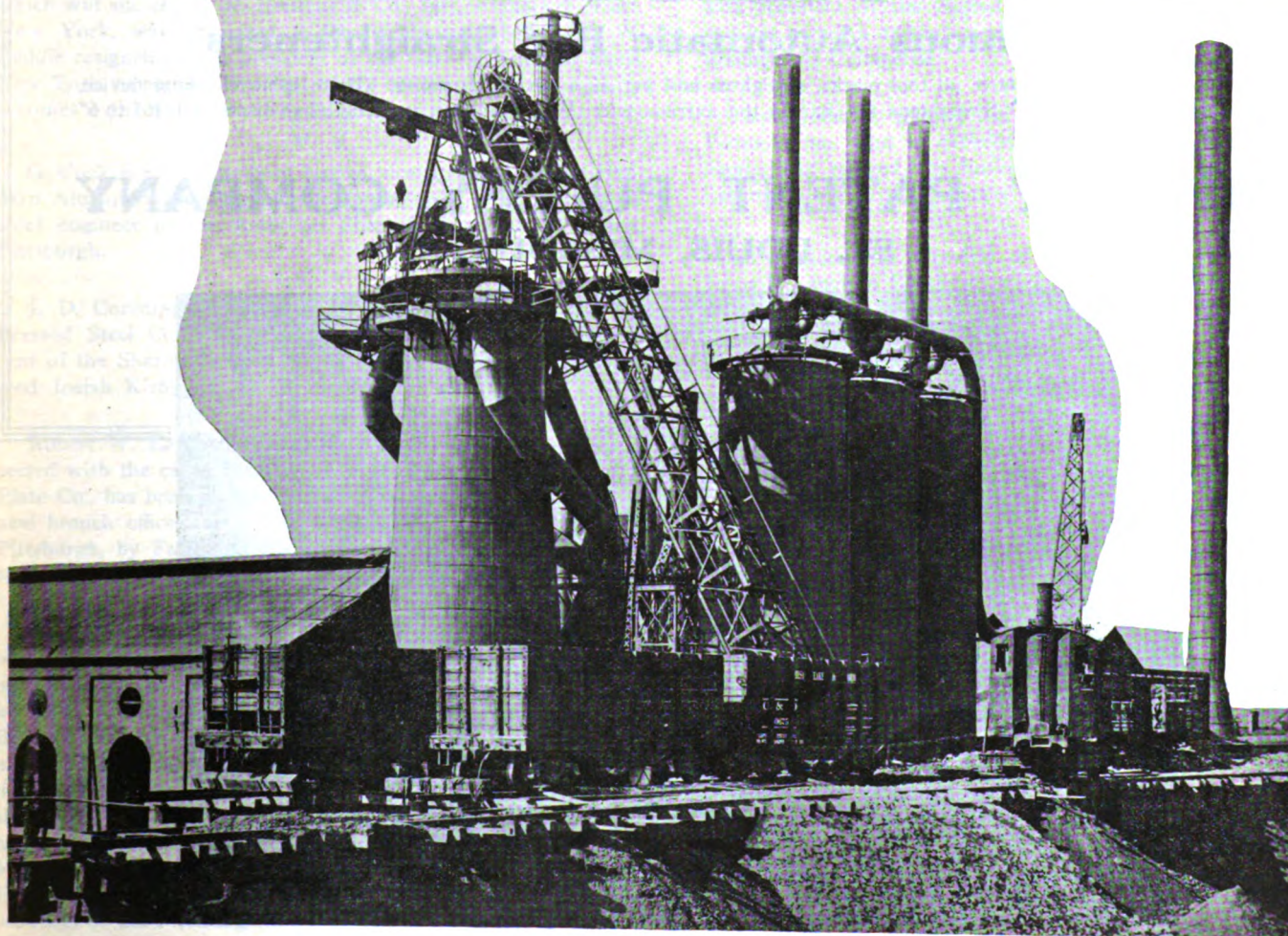
were used, including hearth boshes and tuyere jackets. Typical Virginia conditions were encountered in the construction work and the engineers specified Ashland Steam Pressed Fire Brick for the entire job.

That Ashland linings are usually specified for difficult service is attributed to their long life and ability to make good.

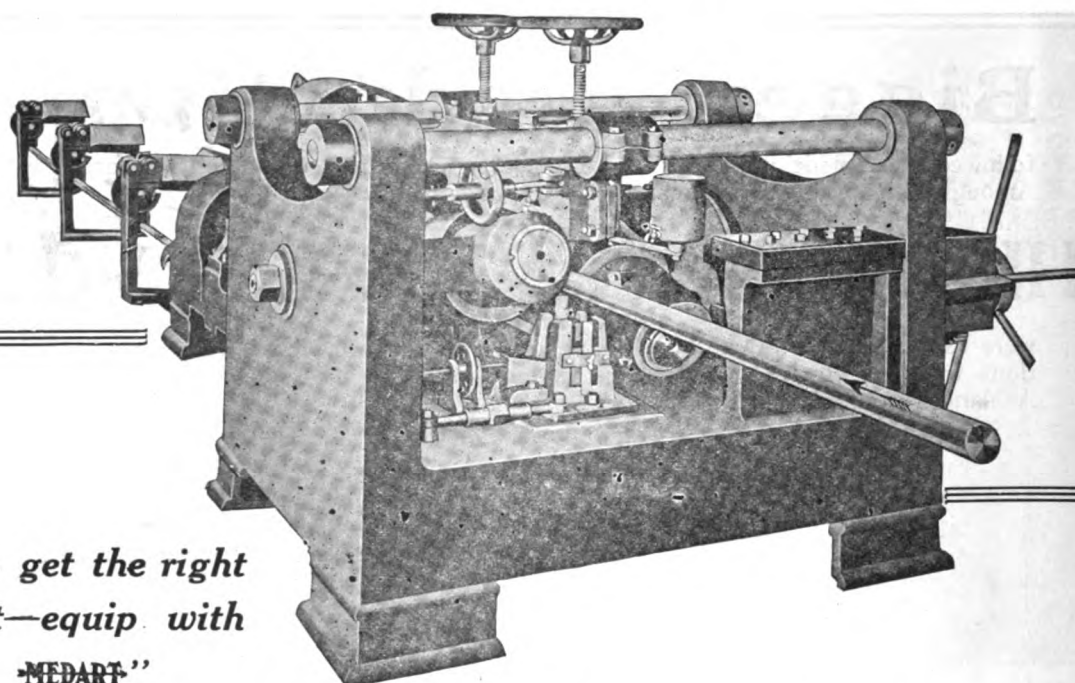
Ashland Refractories mean Furnace Service.
Let us quote you.

Ashland Fire Brick Co.
Ashland, Ky.

Established 1886.



Co-operate:—Refer to The Blast Furnace and Steel Plant



***"To get the right
start—equip with
MEDART"***

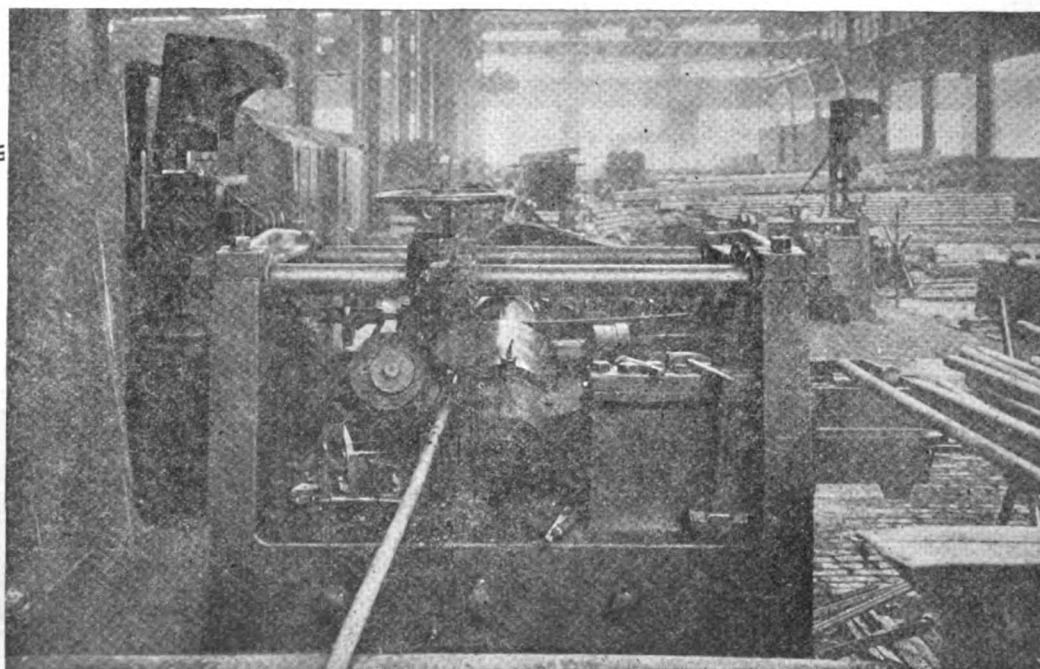
The best possible testimonial for an article is a satisfied user. Medart Continuous Automatic Bar Straighteners are giving satisfaction and service in many world-famous plants. The illustration below shows one of the Medart Straighteners at the plant of the Bethlehem Steel Co., Bethlehem, Pa. Operated by ordinary labor the machines are cutting straightening costs by straightening, polishing and cold rolling in one operation.

MEDART

Continuous Automatic Bar Straighteners

operate continuously. Remove all tool marks, straighten and put on a very high polish. There is no chucking device, consequently the "Medart" Straightens the Bar to the extreme end. Will straighten any length bar diameter 1/16" to 6" from 40 to 80 feet per minute.

MEDART PATENT PULLEY COMPANY
ST. LOUIS, MISSOURI



Co-operate:—Refer to The Blast Furnace and Steel Plant



Rhymed Fable

The mire was deep, the road a sticky mass,
The wagon, heavy laden, could no further pass;
The weary, nerve-strained horses could not move the wheels;
The driver, in despair, upon the wayside kneels
And prays for Hercules, the mighty god of strength,
To give him help. This answer came at length:
"Put your own shoulder to the wheel and shove;
Use all your powers—then aid comes from above."

Moral.

The prayers which we can answer might as well
Remain unspoken for no heavenly spell
Is ever sent to wreath the idle way
Of those too lazy to do aught but pray.
So if your roll necks heat don't rail at fate;
Poor bronze may be the over-
burdening weight.
Damascus Better Bearings you
will find
The easy answer for your ills
designed.



Ask for information and quotations
on Bearings for every purpose.

DAMASCUS BRONZE CO.
PITTSBURGH

Co-operate:—Refer to The Blast Furnace and Steel Plant

6726 KOPPERS COKE OVENS

IN OPERATION OR UNDER CONSTRUCTION
IN THE UNITED STATES AND CANADA
HAVE AN AGGREGATE ANNUAL
CARBONIZING CAPACITY OF MORE THAN

43,000,000 NET TONS OF COAL

Owner or Operator	Location	Number of Ovens
United States Steel Corporation		
Illinois Steel Company	Joliet, Ill.	280
Illinois Steel Company	Gary, Ind.	700
Tennessee Coal, Iron & R. R. Company	Fairfield, Ala.	434
Minnesota Steel Company	Duluth, Minn.	90
Carnegie Steel Company	Clairton, Pa.	768
American Steel & Wire Company	Cleveland, O.	180
National Tube Company	Lorain, O.	208
Woodward Iron Company	Woodward, Ala.	170
Coal Products Mfg. Company	Joliet, Ill.	35
Algoma Steel Corporation, Ltd.	Sault Ste. Marie, Ont.	110
Inland Steel Company	Indiana Harbor, Ind.	130
Republic Iron & Steel Company	Youngstown, O.	143
Bethlehem Steel Company	Sparrows Point, Md.	360
Bethlehem Steel Company	South Bethlehem, Pa.	424
Bethlehem Steel Company	Steelton, Pa.	60
Laclede Gas Light Company	St. Louis, Mo.	56
Cambria Steel Company	Johnstown, Pa.	92
Toledo Furnace Company	Toledo, O.	94
Youngstown Sheet & Tube Company	Youngstown, O.	306
LaBelle Iron Works	Follansbee, W. Va.	94
United Furnace Company	Canton, O.	47
McKinney Steel Company	Cleveland, O.	204
Brier Hill Steel Company	Youngstown, O.	84
Gulf States Steel Company	Gadsden, Ala.	37
Seaboard By-Product Coke Company	Jersey City, N. J.	165
Minnesota By-Product Coke Company	St. Paul, Minn.	65
Colorado Fuel & Iron Company	Pueblo, Colo.	120
Indiana Coke & Gas Company	Terre Haute, Ind.	30
Dominion Iron & Steel Company, Ltd.	Sydney, N. S.	180
Providence Gas Company	Providence, R. I.	40
Jones & Laughlin Steel Company	Pittsburgh, Pa.	300
Rainey-Wood Coke Company	Swedeland, Pa.	110
Alabama By-Products Corporation	Birmingham, Ala.	50
Donner Union Coke Corporation	Buffalo, N. Y.	150
Domestic Coke Corporation	Fairmont, W. Va.	60
Pittsburgh Crucible Steel Company	Midland, Pa.	100
Chicago By-Product Coke Company	Chicago, Ill.	100
Milwaukee Coke & Gas Company	Milwaukee, Wis.	150

THE KOPPERS COMPANY

PITTSBURGH, PA.

DESIGNERS, BUILDERS AND OPERATORS OF BY-PRODUCT COKE PLANTS

Co-operate:—Refer to The Blast Furnace and Steel Plant